ABSTRACT

Title of Dissertation: CHRONIC ILLNESS AND BEHAVIOR PROBLEMS IN CHILDREN: MEDIATING AND MODERATING INFLUENCES

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Research indicates that children living with a chronic illness have a higher level of behavior problems than children not living with an illness. However, mediating factors must be examined in order to create a clearer picture of the influence of a chronic health condition on children. Therefore, this research examined the mediating influence of economic strain, child's health stress, parental psychological distress, and parenting behaviors on child behavior, as well as the moderating impact of social support on all previously mentioned variables. Structural equation modeling was used to model each of these relationships. Data came from responses to the Panel Study of Income Dynamics Child Development

Supplement that included both children not living with an illness (n=806) and children living with a chronic illness (n=693) who were between the ages of 6 and 13 and their primary caregivers. The chronic illnesses included in the sample are anemia (n=120), asthma (n=157), diabetes (n=3), and chronic otitis media (n=522). Comorbidity was present with 102 children living with two illnesses and four children living with three illnesses. The findings indicate that the presence of a chronic illness has a relationship with higher levels of child behavior problems, but health stress and parental psychological distress contribute more to child behavior problems than the presence of illness. Social support was found to buffer the relationships between the presence of illness and economic strain and the presence of illness and health stress. Findings suggest that researchers, practitioners, and policymakers should focus on the alleviation of economic strain, health stress, and parental psychological distress because of their relationship with poorer parenting and higher levels of child behavior problems. Possible directions for future research were also discussed.

CHRONIC ILLNESS AND BEHAVIOR PROBLEMS IN CHILDREN:

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by

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Dissertation proposal submitted to the Faculty of the Graduate School of
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Chapter I: Introduction

Today, 18 percent of American children (12.6 million) 18 years old and younger have a chronic condition that requires some health service beyond routine child medical care (Newacheck, Strickland, Shonkoff, Perrin, McPherson, McManus, Lauver, Fox, & Arango, 1998). Alarmingly, the number of children being diagnosed with a chronic condition continues to rise. For instance, asthma among American children has increased from three percent in 1981 to five percent in 1998 (Benson, 2001). Otitis media, or ear infections, have increased from 34.8 percent of children between 1989 and 1991 to 41.1 percent between 1991 and 1994 (Auinger, Lanphear, Kalkwarf, & Mansour, 2003).

Despite these increased rates of chronic health conditions, in recent decades medical technologies have increased chronic illness survival rates (Blum, Garell, Hodgman, & Slap, 1993). For example, prior to the discovery of insulin, children who were diagnosed with diabetes were expected to die within a year (Krall, 1978). Insulin for diabetes; inhalers and peak flow monitors for asthma; iron supplements, blood transfusions, and bone marrow transplants, for anemia; and antibiotics and ear tubes for otitis media are all treatments that have been discovered in recent years. These medical advances are saving thousands of individuals from disability and some from an otherwise inevitable death.

Chronic illness does not discriminate based on race, age, socioeconomic status, or gender. Although some children -- African-Americans, boys, older children, and children in low income and single-parent households -- are more likely

to be living with a chronic condition (Newacheck, et al., 1998), all families are vulnerable to having a child diagnosed with a chronic illness. The presence of a chronic illness can influence both child and family functioning.

Research in the family health arena has historically focused on the deficit model, in particular the burden of chronic illness on the family and individual. Caregivers were considered to be burdened, passive agents and the individual living with the illness was simply considered "the burden" (Zarit, 1989). Further, the mere presence of a chronic illness was directly linked to pathology and negative effects for children and families (Bedell, Giordani, Amour, Tavormina, & Boll, 1977; Olkin, 1999).

Deficit model research often examines pathology, targets clinical samples that are thought to exhibit the pathology in question, and creates or uses instruments to detect pathology within the sample (Olkin, 1999). Consequently, the research finds that individuals living with a chronic illness exhibit some form of pathology and a discussion of the burden of the "sick" individual on families ensues. Clearly, the deficit literature equates the individual and the disability, creating an asthmatic or a diabetic rather than a person living with asthma or diabetes.

Just as the social sciences utilized the deficit model, so too did the medical field. The medical community not only reduced the individual to an illness, but further reduced the individual to the cellular level (Olkin, 1999). These reductions lead to the examination of deficient genes, cells, or organs instead of focusing on the *individual* living with a chronic illness.

In recent years there has been a paradigm shift from the deficit model to a socioecological[1] or ecological model in the social sciences and medical fields (Pledger, 2003; Schor, Billingsley, Golden, McMillan, & Meloy, 2003; Tate & Pledger, 2003; Wertlieb, 2003). The ecological model examines the relational nature of the illness and the environment (Pledger, 2003). More specifically, the ecological model emphasizes the intersection of environmental, family, and individual characteristics that shape the experience of living with a chronic illness (Pledger, 2003; Tate & Pledger, 2003). For example, medical professionals are shifting focus from illness and cells to examining how families function in relation to health and how to treat and maintain health within the family context (Wertlieb, 2003).

The ecological model tends to examine the protective factors and risks in the environment that may influence individual and family outcomes. For instance, research explores the influence of the disability or illness, separate from the person, on individual and family functioning (Olkin, 1999). Illness is not equated with the individual, and no one pattern of response to chronic illness is expected; instead unique protective factors and vulnerabilities are explored (Brown & DuPaul, 1999). Vulnerabilities or risks might include economic strain and child health stress; whereas protective factors might include parental well-being, positive parenting, and social support. Research that focuses solely on the risks involved in families living with a chronic illness may miss the more important mediating factors such as

[1] The socioecological model "maintains that disability is a product of the intersection of individual characteristics (e. g. , conditions or impairments, functional status, or personal and socioeconomic qualities) and characteristics of the natural, built, cultural, and social environments" (National Institute on Disability and Rehabilitation Research, 1999, p. 2).

economic strain, child health stress, parental mental health, and parenting behaviors (Brown & DuPaul, 1999) as well as the moderating factor of social support. The use of the socioecological model that examines risks *and* protective factors will provide useful information in the study of families and the true environment in which they live (Wertlieb, 2003). Protective factors and risks have been examined previously in research on child behavior problems through the use of mediating and moderating variables.

Previous research has examined the relationships between economic strain, parental well-being, parenting behavior, and child behavior problems, however none of the research has focused on chronic illness (Conger, Conger, Elder, Lorenz, Simons, & Whitbeck, 1992; Jackson, Brooks-Gunn, Huang, & Glassman, 2000; Yeung, Linver, & Brooks-Gunn, 2002). Additionally, the participants involved in the research often represent particular population groups. Conger et al. (1992) focused on rural, Midwest Caucasians, and Jackson et al. (2000) examined urban African American single mothers. In contrast, Yeung et al. (2002) utilized a nationally representative data set, the Panel Study of Income Dynamics Child Development Supplement, to research three to five year olds. The current research expands upon this previous research to examine a nationally representative sample of school age children, ages six to thirteen, who are either living with a chronic illness or not.

Two methodological issues that are present in the current literature on chronic illness -- the use of clinical versus non-clinical samples and the use of

matched control groups -- will also be addressed in the proposed research. Few of the present research studies examine nationally representative samples. Instead smaller samples are drawn from clinical populations (Anthony, Gil, & Schanberg, 2003; Silver, Bauman, & Ireys, 1995). Clinical samples are more likely to be experiencing stress or difficulties in daily life. Additionally, many individuals living with a chronic illness are not involved with hospitals or specialty care.

The research on chronic illness generally does not have randomly sampled control groups. Instead much of the research relies on matched control groups. Matching variables have included gender, race, age, and school grade (Gerhardt, Vannatta, McKellop, Zeller, Taylor, Passo, & Noll, 2003; Holmes, Yu, & Frentz, 1999). However, matched control groups may be problematic because important variables may not be included in the matching criteria (Babbie, 2001). To address these methodological issues, this research uses a nationally representative sample of non-clinical families comparing children living with a chronic illness to those who are not living with an illness.

In order to address the existing gaps in the literature on families living with a chronic illness, the present study uses data collected for the Panel Study of Income Dynamics Child Development Supplement (PSID-CDS) of 1997. The PSID-CDS was constructed to examine economic status and time use of families, parental resources, and the subsequent development of children over time. Using the PSID-CDS data provides not only a nationally representative sample of children, but also a sample that is not selected on the basis of clinical status. Utilizing an ecological

model, this study uses structural equation modeling to examine the influence of chronic illness, economic strain, and child health stress on parental psychological distress; parenting behaviors including warmth, involvement, cognitive stimulation, and emotional support; and child behavior problems. Social support was also examined as a possible moderator or buffer to the previously mentioned relations.

Chapter II: Literature Review

Defining chronic illness

Adult definitions and measures of chronic illness are insufficient for use with children (Westbrook, Silver, & Stein, 1998). When adult measures of chronic illness are used with children, 90 percent of childhood issues are missed (Brooks, 2001). Children cannot be held to the same standards as adults since the goals of childhood are to play, learn, and grow (Westbrook, et al., 1998). To combat these issues, there are numerous definitions of chronic illness that have been created for research, programmatic, and policy considerations (Westbrook, et al., 1998). Various definitions found in the literature include:

> Chronic illness is generally defined as a physical or mental condition that is persistent or recurring and can range from mild to severely disabling (Stark, 2000).
>
> "Chronic illness includes those diseases involving a protracted course that may be fatal or result in compromised mental, cognitive and/or physical functioning and that are often characterized by acute complications, which may result in hospitalizations or other forms of intensive treatment" (Brown & DuPaul, 1999, p. 175).
>
> Chronic illness is the "lived experience, involving permanent deviation from the normal, caused by unalterable pathological changes" (Cameron & Gregor, 1987, p. 672).

Due to the differing definitions, there have been fluctuating reported prevalence rates. Prevalence rates for children living with a chronic condition vary between 5 and 31 percent, with the former reflecting only the most severe conditions and the latter reflecting conditions with modest effects on children's activities

(Newacheck & Taylor, 1992; Newacheck, et al., 1998). To address this concern the Maternal and Child Health Bureau's Division of Services for Children with Special Health Care Needs has created a definition of children with special health care needs. "Children with special health care needs are those who have or are at increased risk for chronic physical, developmental, behavioral, or emotional conditions and who also require health and related services of a type or amount beyond that required by children generally" (McPherson, Arango, Fox, McManus, Newacheck, Perrin, Shonkoff, & Strickland, 1998, p. 138). Using this new definition, research indicates that approximately 18 percent or 12.6 million American children are living with a chronic health condition (Newacheck, et al., 1998).

The Maternal and Child Health Bureau (MCHB) has proposed two categories for operationalizing the new MCHB definition (Neff, Sharp, Muldoon, Graham, Popalisky, & Gay, 2002). The categorical approach is based on the presence of a specific condition a child is living with, such as asthma or anemia (Neff, et al., 2002). The noncategorical approach classifies individuals based on the characteristics related to needs the illness creates such as frequency of service use or functional status (Neff, et al., 2002). The Panel Study of Income Dynamics Child Development Supplement does not provide information relating to the noncategorical approach, therefore the categorical approach that is based on the presence of a specific condition was used in the current research. In the remainder of the chapter, the relationship between chronic illness and child behavior problems addressed in existing literature is described.

Chronic illness and child behavior problems

Historically chronic illness in children was viewed from the deficit perspective, namely individuals are a burden reflecting some pathology, and from this perspective disastrous consequences for children were thought to follow (Bedell, et al., 1977; Olkin, 1999). The deficit perspective often found that children living with a chronic illness experienced greater internalizing and externalizing behavior problems than children living without an illness. For example, Gillaspy et al. (2002) found that high-risk adolescents living with asthma have significantly higher levels of anxiety, depression, and global psychological distress when compared with a matched sample of high-risk individuals not living with asthma. However, the research did not assess the type of risk the adolescents were living with and how the risk contributed to their anxiety and depression. Instead the researchers attributed the difference in psychological distress to the presence of an illness, thus supporting the deficit model.

However, some research does not support the deficit perspective that suggests a positive relationship between chronic illness and child behavior problems. For example, child behavior problems have not been found to be related to the presence of hemophilia (Minden, 1999). Additionally, when children living with a chronic illness are compared with healthy controls, the differences are minimal. For example, one study found that children living with cancer did not differ on measures of depression, anxiety, loneliness, or self-concept when compared with controls (Noll, Gartstein, Vannatta, Correll, Bukowski, & Davies, 1999). Similarly, no differences were found between "healthy" children and children living with chronic

asthma in terms of their emotional regulation, with poor regulation defined by disruptive negative affect and low frustration tolerance (Klinnert, McQuaid, McCormick, Adinoff, & Bryant, 2000).

Further, the deficit perspective has largely ignored family strains or limited social support in families living with a chronic illness that might account for the increase in child behavior problems. The failure to include these additional variables creates an artificial explanation for children's behavior problems and the relationship with chronic illness. Kazak and Christakis conclude "that there is no incontrovertible evidence for a direct, linear, cause-and-effect relationship between illness burden and maladjustment implies that mediating variables must exist" (1994, p. 342). Therefore, research has begun to examine possible mediating and moderating factors that could account for the relationship between chronic illness and behavior problems (Drotar, 1997; Ellerton, Stewart, Ritchie, & Hirth, 1996; Holmes, et al., 1999; Klinnert, et al., 2000; Paradise, Feldman, Colborn, Campbell, Dollaghan, Rockette, Janosky, Kurs-Lasky, Bernard, & Smith, 1999; Perrin, MacLean, & Perrin, 1989; Rogers & Floyd, 2003; Wallander & Varni, 1989). Research is now examining the context or environment of children living with a chronic illness.

Holmes et al. (1999) found that the presence of a chronic illness such as diabetes is associated with mild, nonspecific behavioral problems. However, these behavior problems are synonymous with children's reactions to generalized distress. Additionally, the research points to negative life events and the family environment

influencing the relationship between the presence of a chronic illness and child behavior problems.

There has been some research that does find a relationship between chronic illness and behavior problems. For example, Haffner and associates (Haffner, Ester, Munch, Parzer, Raue, Steen, Klett, & Resch, 2002) found that the presence of a chronic illness was a predictor of behavior problems in children. However the research also showed that chronic illness did not explain a majority of the variance; instead family problems accounted for 10 percent of the variance in child behavior problems. Gender, chronic illness, adverse living conditions, the family composition, and the amount of television the child watched accounted for another 10 percent of the variance in child behavior problems. Therefore, chronic illness explained only a small portion of child behavior problems.

To fully examine the relationship between chronic illness and child behavior problems the context in which the child lives must be examined. The systems within the environment -- family, friends, schools, and employers -- have reciprocal effects on the child and in turn the child on these systems. Because each of these systems impacts one another, the study of chronic illness in children is best examined from the ecological perspective (Bronfenbrenner, 1986).

Ecological model

Many researchers have used the ecological theoretical model in relation to families with a child living with a chronic illness because this model best addresses the contextual factors associated with a chronic illness and how the illness affects the

individual and the family (Kazak & Christakis, 1994; Vinson, 2002). The ecological model is useful for examining the reciprocal impact of chronic illness on individuals and internal and external systems to the family (Kazak & Christakis, 1994). Thus, the model explains that events external to the family unit are just as influential as the activities inside the family unit and inside the individual family member (Bronfenbrenner, 1986). For example, a child's behavior problems are not solely based on the presence of a chronic illness, but are influenced by stresses within the family and the functioning of external factors such as health insurance policies and social supports received from family, friends, and medical professionals. The ecological model acknowledges that external barriers -- such as the flexibility of one's health insurance -- are associated with living with a chronic illness and considers how these factors can affect individual and family functioning.

According to ecological theory, family and individual functioning are embedded in the following four systems: the microsystem, mesosystem, exosystem, and macrosystem (see Figure 1). The ecological model views these four different systems as constantly interacting and influencing each other (Bronfenbrenner, 1986). The microsystem is the individual level that includes the settings that the individual experiences and creates as a day-to-day reality. This level includes such factors as the physical and mental health of the individual, the people with whom the individual living with a chronic illness resides, and the financial viability of the family.

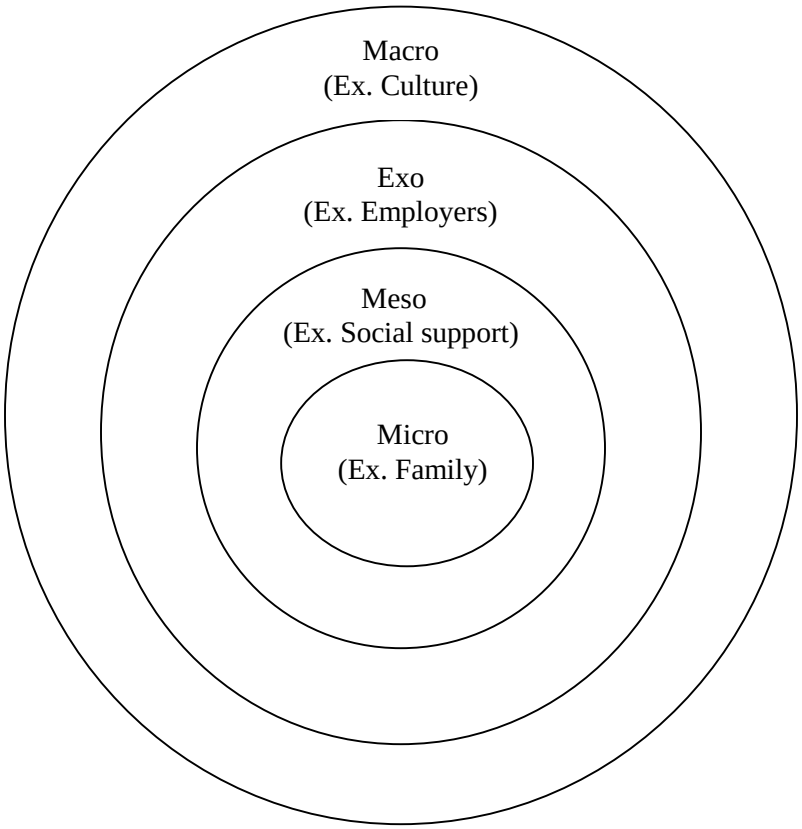


Figure 1: Depiction of the Ecological Model

The mesosystem is the relationship between many other microsystems (Bronfenbrenner, 1986). This level includes the extended family, friends, and other areas of emotional or instrumental support for the family and individual living with a chronic illness. The mesosystem also includes the interaction of doctors, nurses, pharmacists, employers, and schools in the lives of the individual and family. Families living with a chronic illness may have more interaction with the mesosystem than families not living with illness, due to the demands of the illness. For instance, parents may need to take additional leave from work to care for a child

experiencing an acute illness episode; this episode may also necessitate interaction with medical professionals and schoolteachers.

The exosystem and macrosystem are further removed from daily family interaction, but continue to have great influence over family functioning. The exosystem has power over individuals' lives, but individuals possess little control over that system (Bronfenbrenner, 1986). For instance, the policies towards employee leave and health insurance in the workplace are included in the exosystem. Additionally, Medicare, Medicaid, and health insurance companies are in the exosystem and create policies that delineate the cost, availability, and procedures for obtaining medical treatment for those living with a chronic illness.

The macrosystem represents the broad ideological and institutional settings of a particular culture or subculture. The macrosystem includes societal and cultural prejudices and stigma towards individuals living with a chronic illness (Dowling & Dolan, 2001). Historically individuals living with an illness or disability were considered to be defective and generally lacking in ability to function in society (Disability Social History Project, 2001; Morgan, 2001; Russell, 1998). Although these beliefs have been changing in recent years, their historical legacy continues (Dowling & Dolan, 2001). The influence of the macrosystem on the other systems and its reciprocal relationship to the ecological model is displayed in the following example. The stigma and stereotypes of illness in society (macrosystem) may affect the employer's choice of medical insurance (exosystem), the presence of extended

familial social support (mesosystem), and the individual's personal beliefs about the illness s/he must live with (microsystem).

The ecological framework also addresses risks and protective factors that are present in the four systems. Risk to the individual and family may be directly related to the presence of a chronic illness (Cadman, Boyle, Szatrnari, & Offord, 1987). Additional risks might include external issues such as societal stigma, federal policy regulations, and types of health coverage, as well as internal aspects such as economic strain, health stress, parental psychological distress, and child behavior problems. Unfortunately, often the relationships with health care providers, insurance companies, and government agencies are among the most stressful for individuals and families living with a chronic illness (Doherty, McDaniel, & Hepworth, 1994).

In contrast, protective factors may help to remove risk from families and individuals. Creating a shared family view of the illness is often a protective factor. For example, the impact of the illness on the family tends to decrease when the parents of a child living with a chronic illness have a shared view of the illness, its management, and its impact on the family (Knafl & Zoeller, 2000). Protective factors might also include attending support groups, having helpful extended family and community supports, and/or medical professionals who are willing to educate and work together with the family. Finally, positive parenting may act as a protective factor and help to reduce the risk of child behavior problems.

Theoretical research model.

The ecological model and previous research helps to shape the theoretical model that was employed in the current research (see Figure 2). As shown, the presence of a chronic illness is hypothesized to affect economic and child health stressors, parental psychological distress, and child behavior problems directly. The model does not imply that the economic strain, parental psychological distress, and child behaviors are created solely by the presence of illness, just that the illness has some impact upon these variables. According to the model, the influence of illness on parenting behavior is mediated by economic strain, child health stress, and parental psychological distress. The economic and child health stressors directly influence parental psychological distress and indirectly influence parenting behavior and child behavior. Economic strain directly influences the parenting behavior of cognitive stimulation. Child health stress also directly impacts child behavior problems. Parental psychological distress directly influences parenting behaviors and child behavior problems. Finally, parenting behaviors directly influence child behavior problems. The model posits that social support will moderate each of the previously mentioned relations. However mid to high levels of social support, as reported by the primary caregivers, will be a more successful moderator than low levels of social support. The following sections examine the literature on the previously mentioned relations.

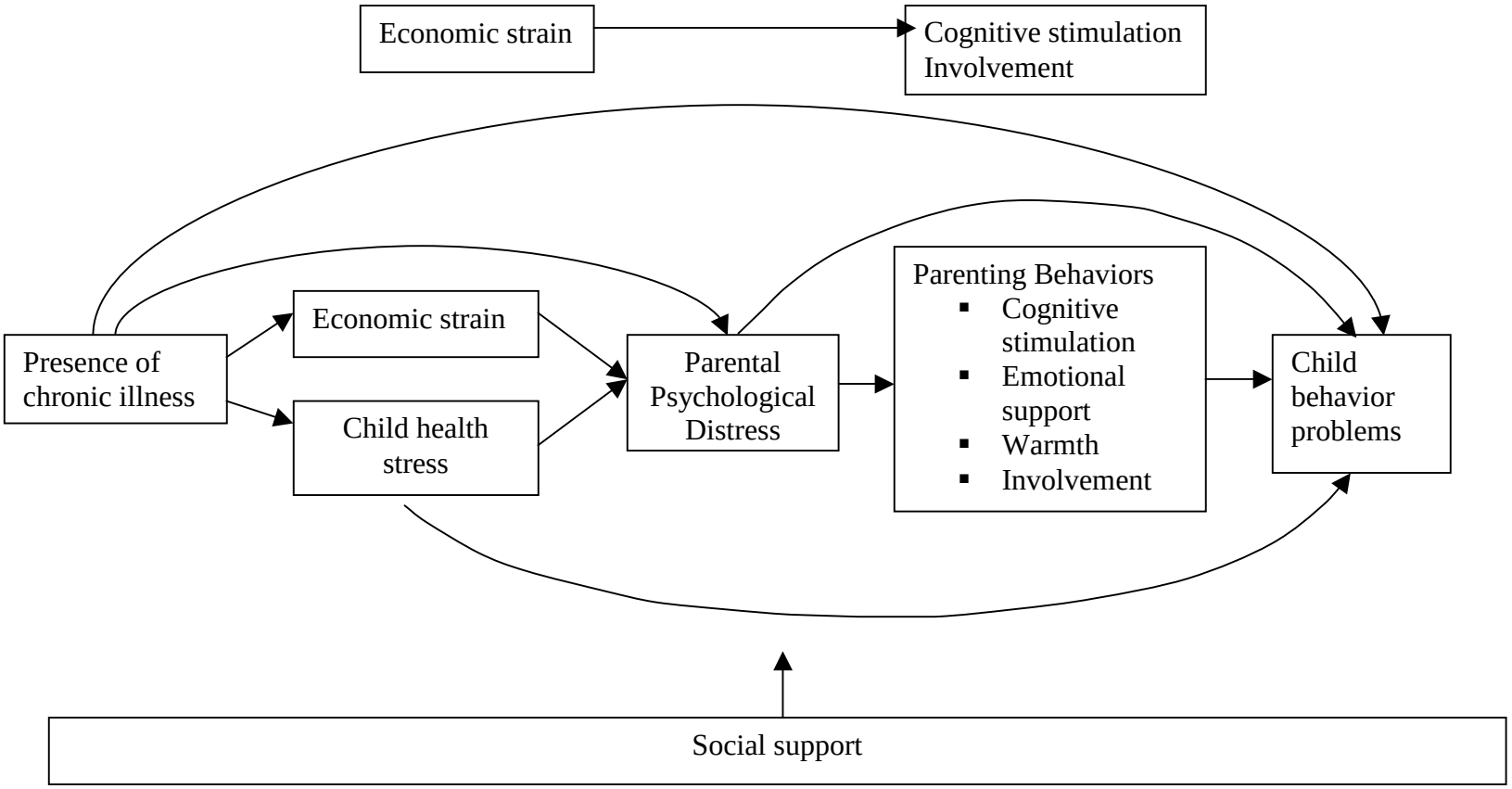


Figure 2: Theoretical Model
Note: Social support will moderate each of the above relations. The two levels of social support, low and mid to high, will be compared for each relation.

Economic strain

"Economic strain refers to the subjective evaluation of one's financial situation" (Voydanoff & Donnelly, 1998, p. 346) and may be marked by a lack of financial resources such as not having enough money at the end of the month, postponing family purchases, and not having health insurance. The operationalization of the economic strain concept is broad enough to capture any family that experiences financial shortfalls. Under this definition it is possible that middle and upper class families as well as families from lower socioeconomic classes experience economic strain. Therefore, economic strain is not equated with poverty (McLoyd, 1990). However, economic strain is not a concept that is used in federal statistics. Therefore, at times the inclusion of research on poverty illustrates some of the problems families living under economic strain may face.

Economic strain and chronic illness.

A search of the social science literature on economic strain**,** chronic illness, and children produced very limited results. Currently, there is research on children in *poverty* who are living with a chronic illness, but as mentioned previously economic strain and poverty are two very different concepts (McLoyd, 1990). The financial burden due to the presence of asthma was examined in a study of families living in East Harlem, New York with children (23 African American and Hispanic) living with asthma (Mailick & Holden, 1994). The research found large, significant correlations between financial strain, social isolation, and personal strain (Mailick &

Holden, 1994). However the study used a convenience sample of 23 parents providing little generalizability (Mailick & Holden, 1994).

The resources, both financial and emotional, that families have may be more important when a child is living with a chronic illness. The research shows that children who are living with a chronic illness and have good general functioning are more likely to have more resources than children who are living with a chronic illness but have lower general functioning (Jessop & Stein, 1985). Research also indicates that even if the family has low income, as long as basic needs are met, the lack of income does not contribute to negative psychosocial outcomes in families living with a child with sickle cell anemia (Barbarin, Whitten, Bond, & Conner-Warren, 1999). Although the research is limited, one could hypothesize that having a chronic illness may either create economic strain or increase levels of current strain due to the financial requirements of disease care.

Individual health is often compromised due to economic strain, although causation is not explained with cross-sectional data (Chen, Matthews, & Boyce, 2002). For example, is it the demands of the illness that prevent parents from seeking or maintaining employment when their child is ill (Dowling & Dolan, 2001; Kazak & Christakis, 1994; Smith, Romero, Wood, Wampler, Chavkin, & Wise, 2002) or does the lack of financial resources lead to decreased physical well-being and the presence of chronic illness in children? Nevertheless, low income children are more likely than higher income children to experience fair or poor health (Vandivere, Moore & Brown, 2000) and to live with a chronic condition (Wise,

Wampler, Chavkin, & Romero, 2002). Specifically, low levels of income have been found to be related to the prevalence of asthma (Miller, 2000), otitis media, and anemia (Egbuonu & Starfield, 1982) in children. However, again causation is not clear.

Economic strain and child health stress.

Family economic strain may also influence the child's health stress created by the illness, as evidenced by poor health ratings, physical limitations, and severity of symptoms. Children living below the poverty line are less likely than children of higher incomes to be in good or excellent health as rated by their parents (Benson, 2001). Similar to parental ratings, children with a lower socioeconomic status tend to have more physical limitations due to a chronic condition.

One national study found that 11 percent of children living in poverty, between the ages of 5 and 17, are physically limited due to a chronic condition versus 7 percent of children in families above the poverty line (Benson, 2001). Low income may also be associated with complications created by the chronic illness, possibly due to the family's inability to afford adequate health care. For example, low income has been related to hearing impairments caused by chronic otitis media (Egbuonu & Starfield, 1982).

The financial costs associated with maintaining the health of children living with a chronic illness often add additional economic strain. The estimated cost for treating otitis media in the United States is $2.9 billion in direct and $2.1 billion in indirect (e.g., lost wages) costs (Kirschstein, 2000). In general, individuals living

with a chronic illness can expect to pay an average of $369 per year in out-of-pocket expenses, whereas those without a chronic condition spend $182 per year (National Chronic Care Consortium, 2003). Yearly treatment of asthma can range between $326 to $1,315 per person (National Institutes of Health, 1996). These additional costs can influence the financial allocation of funds in families. For example, the cost of medications for children with chronic otitis media may cause parents to have to weigh paying for medical costs against needed household items (Asmussen, Olson, & Sullivan, 1999). Many families who are seeking health care express concerns that they will be financially unable to afford the care (Barlow, 1997).

Often many of the financial costs of living with a chronic illness are reimbursed through health insurance. In 1999, 86 percent of children had health insurance; however, 14 percent did not (Benson, 2001). Poor children are at the greatest risk for inadequate or absent health insurance (Wise, et al., 2002). Uninsured children are more likely to have poorer quality of medical care than their insured counterparts (Ferris, Crain, Oken, Wang, Clark, & Camargo, 2001), possibly leading to a higher rate of hospital and emergency room usage in low income children (Miller, 2000).

Gaps in coverage may create unmet healthcare needs. Near-poor and poor children are three times more likely to have an unmet health care need (e.g., medical, dental, and vision care; prescription medications) than non-poor children (Newacheck, Hughes, Hung, Wong, & Stoddard, 2000). Uninsured children are three times more likely to have an unmet healthcare need than insured children

(Newacheck, et al., 2000). General economic strain coupled with the financial costs of health insurance, illness maintenance, and unmet healthcare needs may create mental health stress in parents.

Economic strain and parental psychological distress.

Economic strain may be a constant stressor for parents. This stressor can lead to feelings of tension and sadness (Voydanoff & Donnelly, 1998), or other forms of psychological distress such as depression (Belle, 1990; Conger, et al., 1992; Elder, 1998; Jackson, et al., 2000; Kwon & Rueter, 2003; Lorenz, Conger, & Montague, 1994; Simons, Lorenz, Wu, & Conger, 1993; Vinokur, Price, & Caplan, 1996; Voydanoff & Donnelly, 1998). Resource loss, which may accompany economic strain, has also been linked to increased emotional distress including depression (Hobfoll, Johnson, Ennis, & Jackson, 2003).

Economic strain and parenting behavior.

Economic strain indirectly influences parenting practices through the psychological health of the parent. The relationship between economic strain and parenting quality has been found to be mediated by the parent's emotional well being (Conger, et al., 1992; Jackson, et al., 2000; McLoyd, 1990; McLoyd & Wilson, 1990; Simons, et al., 1993). The mediation effect has found that higher levels of economic strain are related to parenting practices such as decreased involvement and warmth (Elder, 1998; McLoyd, 1990; Pinderhughes, Nix, Foster, & Jones, 2001) and increased punitive parenting (Elder, 1974). For instance, mothers experiencing psychological distress have reported greater difficulty in parenting and are less

nurturing than mothers who are not experiencing psychological distress (McLoyd & Wilson, 1990).

Economic strain may directly influence parents' ability to cognitively stimulate their children (Guo & Harris, 2000; Miller & Davis, 1997). Higher income families are financially better able to provide a cognitively stimulating environment (e.g., books, puzzles) than lower income families (Garrett, Ferron, Ng'andu, Bryant, & Harbin, 1994). Thus, higher income has been associated with better learning environments, including the presence of educational toys and encouragement from parents to learn (Klebanov, Brooks-Gunn, & Duncan, 1994). Cognitive stimulation and other parenting behaviors have been found to be directly related to child behavior.

Similarly, economic strain can negatively influence parental involvement in their child's life (Simons, Lorenz, Conger, & Wu, 1992). Financial strains may require parents to obtain additional employment, which then detracts from the possible time spent with their children. However, research has found that the mere presence of economic strain is negatively related to the time parents and adolescents spend engaging in activities together such as playing a game or sport (Voydanoff & Donnelly, 1998). In sum, economic strain increases the level of parental psychological distress; parental psychological distress in turn negatively affects parenting practices; which may ultimately create negative effects on children (Conger, et al., 1992; Conger, Patterson, & Ge, 1995; Conger, Rueter, & Conger, 2000; McLoyd, 1990; Yeung, et al., 2002).

Economic strain and child behavior problems.

Economic strain can also influence children's behavior problems indirectly through parental psychological well-being. Parents living with economic strain and who report psychological distress tend to have children that are at increased risk for behavior problems (Coiro, 1997) and poor emotional well-being (Kwon & Rueter, 2003). Parents' well-being not only directly influences child behavior, but also indirectly affects behavior through parenting behaviors. When parental psychological health is compromised, research indicates that the quality of parenting practices decreases.

Economic strain can also indirectly influence child behavior problems (Elder, 1998; Takeuchi, Williams, & Adair, 1991; Vandivere, et al., 2000). Research has shown children from lower levels of socioeconomic status, whether they are living with a chronic illness (e.g., diabetes, otitis media) or not, have higher levels of behavior problems than children who are more economically advantaged (Holmes, et al., 1999; Paradise, et al., 1999). In a recent study, the influence of family income on child outcomes was examined using mediator variables in the Panel Study of Income Dynamics Child Development Supplement (Yeung, et al., 2002). The research indicates that family income is associated with child behavior problems, in children aged three to five, through the mediating variables of maternal psychological distress and parenting practices (Yeung, et al., 2002). Thus, the previous literature points to the connection between economic strain and parent psychological distress, parenting behaviors, and child behavior problems.

Child health stress and chronic illness

Both children living with a chronic condition and those that are not may experience health stress. However, children living with a chronic illness have a much higher chance of incurring health stress due to the illness than those without a chronic condition. Health stresses may be experienced by the child in the form of activity limitations, school absences, schoolwork difficulties, or a general poor rating of health.

In 1992, Newacheck and Taylor (1992) reported that 31 percent of children were living with chronic conditions. Of those children, 66 percent had mild conditions with little or no activity limitation and the illness created little or no bother in their lives. Twenty-nine percent of those with chronic conditions reported moderate severity of the illness with some bother or activity limitation. The remaining five percent experienced severe chronic conditions, with frequent bother and limitation. Less specifically, a 1998 study found that chronic health conditions limited the activities of seven percent of America's children aged five to seventeen (Benson, 2001). Furthermore, chronic health conditions account for 66 million days of restricted activity per year for children (Newacheck & Halfon, 1998).

Activity limitation can range from a restriction in play to limitations in the ability to conduct major activities, such as personal care (Newacheck & Halfon, 1998). For example, the presence of recurrent otitis media has been found to limit a child's ability to play (Asmussen, et al., 1999). Children living with a chronic illness have reported that restriction from activities due to illness is a major illness stressor

(Ellerton, et al., 1996). Although all children can experience activity limitation, those living with a chronic condition are more likely to face such limitations.

Msall and associates (Msall, Avery, Tremont, Lima, Rogers, & Hogan, 2003) examined the functional and school limitations of 41,300 school-age children. Of children living with a chronic illness (e.g, diabetes), episodic impairment (e.g., recurrent otitis media), or asthma, 15 to 18 percent were found to have a severe functional disability such as difficulty with mobility, self-care, communication, or learning-behavior. Conversely, only 4.7 percent of children who do not experience medical impairments had such limitations (Msall, et al., 2003). Thus children living with a chronic illness are more likely to experience functional and school limitations than healthy children.

School limitations may be in the form of difficulty completing schoolwork or missed school days. Children living with a chronic illness may have many absences from school (Klerman, 1988; Rodder, Kroonenberg, & Boekaerts, 2003). When compared with non-ill children, children living with a chronic illness have three times as many school absences as other children (Newacheck, et al., 1998; Msall, et al., 2003). It is estimated that 24 million days of school are missed each year due to chronic health conditions (Newacheck & Halfon, 1998). These school absences may be a function of unmet health care needs (Weitzman, Klerman, Lamb, Menary, & Alpert, 1982) or an indication of acute medical phases. Unfortunately, absences from school are linked to poor school performance (Weitzman, et al., 1982), and children living with a chronic illness who miss school have lower school

achievement than the general absentee population (Schwarz & Lui, 2000). Thus, children living with a chronic illness may have difficulty completing schoolwork while absent and may be unable to effectively complete schoolwork once back in school.

Children living with a chronic illness may face more activity, school, and schoolwork limitations than children not living with an illness. Furthermore, these limitations, coupled with the parental perception of the severity of the illness (e.g., number of acute phases) may cause the parent to rate the child as being in fair or poor health. The presence of these limitations and perceived rating of health may act as stressors for both the parents and child.

Child health stress and economic strain.

As previously discussed, economic strain is related to child health stress, with unclear causality. The presence of economic strain may create barriers to attending medical appointments, purchasing medical equipment or medication, or maintaining appropriate dietary requirements. To prevent acute medical phases, medical attention must be sought early, and compliance with medical advice is necessary (Dosa, Boeing & Kanter, 2001). Thus, economic strain may increase children's health stresses. Conversely, children's health stress may cause parents to be unable to hold steady employment due to missed school days and additional time required for medical treatments. Nonetheless, child health stress is a drain on both parents and children.

Health stress and parental psychological distress.

When families are living with both economic strain and child health stress, parents may experience higher levels of psychological distress. In general, higher levels of psychological distress have been found to be related to a pile-up of stressors, such as unemployment, family conflict, health problems, and low self-esteem (Gerard & Buehler, 1999; Hoard & Anderson, 2004; Silver, et al., 1995). Whether parents are experiencing their child's health stress alone or a pile-up of health and other stressors, their psychological well-being can be influenced by the strain.

The diagnosis of a chronic illness creates new challenges and losses that must be addressed by both parents and children (Mullins, et al., 1995). Research indicates that both parents and children show mild symptoms of psychological distress after the illness has been diagnosed (Northam, Anderson, Adler, & Werther, 1996). However, with time the symptoms fade, with the exception of those who experience more severe psychological symptoms at the onset (Thernlund, Dahlquist, Ivarsson, & Ludvigsson, 1996). The presence of child health stress may prolong the period of time it takes for symptoms of psychological distress to recede.

Parents may experience psychological distress in the form of anxiety or frustration due to their inability to directly control the illness and its course. Fisher (2001) examined the literature on the needs of parents living with a child with a chronic illness and found that parents need normality and certainty. However, normality and certainty are difficult to obtain when the child is living with health

stress. For example, parents of children living with recurrent otitis media report frustration over the inability to predict future cases of otitis media (Asmussen, et al., 1999). In working with parents of children living with diabetes, a father reported to me that each time his child's blood sugar was outside of the desired range he felt like he was a bad father. This lack of control may lead parents to question their efficacy as a parent, thus creating psychological distress.

The severity of the chronic illness, as perceived by the parent, may also influence parental well-being. Parents of children living with severe sickle-cell anemia reported more strain, anxiety, and anger creating overall poorer parental adjustment (Barbarin, et al., 1999). Conversely, disease severity has been found to not be predictive of parental psychological distress in families living with juvenile rheumatoid arthritis (Manuel, 2001). Some research does indicate that functional health stresses (e.g., activity limitations) are more significantly related to parental psychological distress than the severity of the illness (Canning, Harris, & Kelleher, 1996; Manuel, 2001; Timko, Stovel, & Moos, 1992; Wallander, Varni, Babani, Banis, & Wilcox, 1989).

Whether it is parental perception of illness or functional limitations, parental reaction to the presence of the chronic illness may affect the child living with the illness. When parents believe the illness is severe and that their child is vulnerable, there has been found to be an increase in social anxiety in children even when disease severity and child's age are controlled (Anthony, et al., 2003). This

relationship may point to the transmission of parental belief of child health stress to children.

Child health stress and child behavior problems.

Children do directly experience the effects of health stress. The presence of health stressors may lead children to become frustrated with the illness and the limits that it places on their activities (Ellerton, et al., 1996). For example, children with diabetes often have periods of hypoglycemia or low blood sugar where they must stop what they are doing and receive treatment (e.g., orange juice or glucose tablets). Treatment for the hypoglycemia is not instantaneous, and thus the child must sit or remain still until the treatment takes effect. Episodes of hypoglycemia can occur at any time, but may be more frequent during active periods such as sporting events. In this case, the illness is causing the child to sit out and not participate. This frustration, caused by the illness, may then lead to frustration and ultimately an increase in behavior problems.

Similarly, children may become frustrated because they do not feel well physically. Physical feelings/symptoms of the illness may indicate the severity of the illness, which may be reflected in parental ratings of the child's health. Research has found that children living with severe asthma have difficulties with emotion regulation, behavior problems, interpersonal difficulties (Klinnert, et al., 2000), and social adjustment, evidenced by lower levels of social competence and ability to meet new challenges (Perrin, et al., 1989).

Although chronic illness is typically invisible, children living with a chronic illness may be teased for simply living with the illness or for complying with a required medical regimen (Barlow, Harrison, & Shaw, 1998). Teasing may occur because of special meals, trips to the nurse's office for medication, not being able to fully participate in gym class, or the inability to eat sugary foods. The teasing may be due to the "healthy" peers' negative impression of chronic illnesses such as diabetes (Underwood, 1997) or unspecified illnesses (Bukowski & Anita, 2000). This teasing may create internalizing (anxiety, withdrawal) and externalizing (anger, aggression) behavior problems in the child living with a chronic illness.

Transitions in the family may be more difficult due to the presence of a chronic illness (Kazak & Christakis, 1994) and the child's health stress. Parents may prevent children living with a chronic illness from passing through traditional social developmental milestones. For example, parental involvement in the child's life especially if health stresses exist, may prevent a child from becoming independent (Barlow, et al., 1998). Parents may also limit the type and extent of interaction with peers, which can negatively impact peer relationships (Nassau & Drotar, 1995). Parents may be fearful of allowing their child who is experiencing health stresses to behave as "healthy" do children. This overprotection may cause children to act out as a way to exert independence. Thus, child health stressors can influence children and parental well-being as well as the parent-child relationship.

Parental psychological distress

Parental psychological distress may be thought of as the presence of depression and anxiety. Approximately 32.6 to 35.1 million American adults (12.6 percent) experience a major depressive disorder in their lifetime (Kessler, Berglund, Demler, Jin, Koretz, Merikangas, Rush, Walters, & Wang, 2003b). In a 12-month period, approximately 6.6 percent or 13.1 to 14.2 million adults experience an episode of major depressive disorder with the average episode lasting 16 weeks (Kessler, et al., 2003b). Of those cases, 10.4 percent are mild depression, 38.6 percent are moderate levels of depression, 38.0 percent are severe depression, and 12.9 percent are very severe levels of depression (Kessler, et al., 2003b). Of individuals with severe or very severe levels of depression, 59.3 percent experience role impairment (Kessler, et al., 2003b). Depressive symptomatology often presents as feelings of sadness or hopelessness, changes in sleep, cognitive processing, and decreased energy (American Psychiatric Association, 2000).

Anxiety is another form of psychological distress. In a 12-month period, three percent of the adult population experience some form of anxiety. Lifetime prevalence rates for anxiety in adults are five percent (American Psychiatric Association, 2000). Anxiety is often thought of as "a diffuse emotional reaction that is out of proportion to threats from the environment" (Oltmanns & Emery, 1998, p. 676). Although anxiety and depression represent differing aspects of psychological distress, research indicates that role impairment of anxiety disorders can be compared with that of depression (Kessler, DuPont, Berglund, & Wittchen, 2000).

Parental psychological distress and chronic illness.

Some research finds that the presence of a chronic illness can increase parental psychological distress both during initial diagnosis (Northam, et al., 1996; Thernlund, et al., 1996) and throughout the illness course (Barlow, et al., 1998; Cadman, Rosenbaum, Boyle, & Offord, 1991). Mild symptoms of psychological distress have been found in parents after the diagnosis of diabetes in their children, but these symptoms tend to fade with time (Northam, et al., 1996; Thernlund, et al., 1996). However, parents may experience psychological distress as a reaction to the presence of a chronic illness in their childs' lives.

For example, parents of children living with juvenile chronic arthritis have reported anxiety about the future and guilt about the possibility of heredity and the inability to provide children with reassurance about the future (Barlow, et al., 1998). Anxiety and guilt were the primary emotions parents felt towards the illness. Families not living with a chronic illness may not experience such anxiety and guilt.

Research has found that parents of children living with a chronic illness tend to have higher levels of psychological distress when compared with "healthy" controls. For instance, mothers of children living with a chronic illness have increased negative affect scores in comparison to mothers of children not living with an illness (Cadman, et al., 1991). These rates of psychological distress may be related to additional stressors families face. Fathers of children with a chronic illness, when compared with fathers of healthy children, have been found to experience a greater number of stressful life events such as financial and work

stresses (Katz & Krulik, 1999). Daily hassles created by the illness may also add to psychological distress. For instance, chronic otitis media has been found to disrupt parents' daily lives in areas like sleep, work schedules, and childcare (Asmussen, et al., 1999).

Conversely, some research has indicated that the presence of a chronic illness does not lead to negative effects on parental well-being. Contrary to expectations, the caregiving role was not found to be deleterious for parental well-being in a sample of predominantly Caucasian (n=5,782) parents caring for either a child, spouse, or parent living with a chronic condition (Marks, 1998). Families of children living with juvenile rheumatoid arthritis generally reported similar levels of parental psychological distress, family functioning, and social support when compared with "healthy" controls (Gerhardt, et al., 2003). It is possible that the examination of mediating variables, such as family functioning, lessens the effects of the illness and presents a realistic picture of the family environment.

Higher levels of parental well-being in families living with a chronic illness may be mediated by parents seeking therapeutic assistance. Parents of children living with a chronic illness may be better able to seek help for psychological distress because of their continued involvement in the health care setting. In a community sample, parents of children living with chronic illness were more likely to report mental health treatment than healthy parents (Cadman, et al., 1991). Treatment for psychological distress may act as a protective factor. Whether parents

seek help or not, psychological distress can affect all other aspects of life such as parenting and relationships with loved ones.

Parental psychological distress and parenting behaviors.

In a report to Congress on effective parenting, the National Council on Family Relations (2003) states that effective parenting such as involvement with the child, cognitive stimulation, emotional support, and warmth, is only possible when the mother experiences *emotional, psychological, and physical well-being*. For instance, when a parent experiences emotional or psychological distress, parents may provide less emotional support to their children and use more harsh discipline (Elder, 1974; Richters & Pellegrini, 1989). Thus, anxiety or depression can affect parenting practices.

The symptomatology associated with psychological distress may prevent parents from using positive parenting behaviors. For instance, fatigue or a decrease in energy are symptoms of both depression and generalized anxiety disorder and may prevent parents from interacting with their children. Parents living with psychological distress may isolate themselves from the family and the child, thus reducing cognitive stimulation, emotional support, and warmth.

Parenting practices have been found to be affected by the presence of depression in parents, with higher levels of depressive symptoms directly and negatively linked to parenting quality (Jackson, et al., 2000). Parents living with depression may reduce the effort they put into interaction with their children (Downey & Coyne, 1990), and be less nurturing and involved with their child

(Conger, et al., 1992; Simons, et al., 1992; Voydanoff & Donnelly, 1998). Parental depression has also been found to be related to lower levels of cognitive stimulation and emotional support, and a poorer physical home environment, as evidenced by a dark/monotonous interior or unsafe play area (Jackson, et al., 2000; Klebanov, et al., 1994). Low levels of cognitive stimulation, emotional support, and poor physical home environment have been linked to children's behavior problems (Jackson, et al., 2000).

Parental psychological distress and child behavior problems.

In general, parental psychological distress directly and significantly influences children (Jackson, et al., 2000). Children may become troubled and begin to act out when their parents are experiencing psychological distress. For example, school-aged children living with a parent who is experiencing depressive symptomatology have been found to show higher levels of behavior problems, both externalizing and internalizing, when compared with children whose parents are not experiencing depressive symptomatology (Lee & Gotlib, 1989; Richters & Pellegrini, 1989). Similarly, parental psychological distress, particularly in mothers, has been found to be related to poor child adjustment in "healthy" children (Downey & Coyne, 1990) and children living with a chronic illness (Drotar, 1997). In families where a child is living with either asthma or diabetes, higher levels of parental distress are associated with internalizing problems for the children living with the illness in comparison to healthy controls (Rogers & Floyd, 2003). Children's

behavior problems are clearly associated with parental well-being, but are also linked to parenting behaviors.

Parenting behaviors

Parenting behaviors are directly linked to child outcomes. Positive parenting behaviors such as cognitive stimulation, emotional support, warmth, and involvement have been found to decrease child behavior problems (Conger, et al., 1992; Gerard & Buehler, 1999). As discussed previously the relationship between parenting behaviors and child behavior has been found to be influenced by additional variables such as economic strain and parental psychological distress. Luckily supportive parenting has been found to buffer effects of family adversity, such as economic strain, on children (Pettit, Bates, & Dodge, 1997).

Parenting behaviors and chronic illness

The literature is extremely limited in the area of parenting behaviors and chronic illness. Although there may be additional strains involved in living with a chronic illness, parents may use the same parenting behaviors for children living with and without a chronic illness. On the other hand, parents may become overprotective of children living with a chronic illness restricting their ability to become independent (Barlow, et al., 1998). Parents may also spend more time with the child living with a chronic illness due to the demands of the medical regimen. In total, these behaviors may create a unique environment for the child living with a chronic illness.

Parental cognitive stimulation.

Parental cognitive stimulation can be defined as the family and environmental factors that promote children's learning and understanding of the world around them. Parents may encourage hobbies, reading, or take the child to cultural events as a way of providing cognitive stimulation. Economic strain may negatively influence the ability of parents to provide adequate cognitive stimulation because of the financial and time requirements of cognitive stimulation

There is a relationship between socioeconomic status and level of parental cognitive stimulation with lower income families providing lower levels of cognitive stimulation than families of higher incomes. Low income children tend to read infrequently, have less access to books and computers, and parents are less involved in their school activities (Evans, 2004). However, families are resilient and may care or provide for their children in resourceful ways. Thus previous research suggests that the cognitive stimulation can mediate the influence of economic strain on children (Cosica, Christensen, Henry, Wallston, Radcliffe, & Rutstein, 2001; Linver, Brooks-Gunn, & Kohen, 2002; Menaghan & Parcel, 1991; Parcel & Menaghan, 1990).

Cognitive stimulation has been found to be related to positive outcomes for children. With greater cognitive stimulation, there are fewer behavior problems in children (Jackson, et al., 2000), and the stimulation acts as a protective factor against future behavior problems (Parcel & Menaghan, 1993). More specifically, greater cognitive stimulation is related to lower levels of childhood aggression and social

withdrawal (Saltaris, Serbin, Stack, Karp, Schwartzman, & Ledingham, 2004). Children who are raised in strong home environments characterized by higher levels of cognitive stimulation have been found to have fewer behavior problems than children not raised in such environments (Rogers, Parcel, & Menaghan, 1991).

Parental emotional support.

Parental emotional support is the interpersonal interaction (e.g., time spent together, verbal communication, and discipline) between family members, particularly the parent and the child. Research has found that when emotional support is lacking, children can experience negative outcomes. McLoyd and Smith (2002) recently examined the relationship between emotional support and behavior problems in 1,039 Caucasian, 550 African American, and 401 Hispanic children. Their findings indicate that children who receive low levels of parental emotional support have more behavior problems than children who receive higher levels of support. Conversely, positive outcomes occur when emotional support is present. For example, emotional support has been found to increase adherence to medical regimens for children living with diabetes (La Greca & Bearman, 2002).

The emotional support that parents provide remains with children into their adulthood. For example, in a nationally representative sample of adults reporting on their childhood, researchers found that the lack of parental emotional support during childhood was related to higher levels of depressive symptoms in adulthood (Shaw, Krause, Chatters, Connell, & Ingersoll-Dayton, 2004). Clearly, parental emotional

support influences not only childhood outcomes, but can also affect later adult functioning.

Parental warmth.

Similar to parental cognitive stimulation and emotional support, parental warmth influences children's functioning. Parental warmth towards a child is operationalized as the demonstrative interaction, physical affection, and time spent in positive discussions with a child (Peterson & Zill, 1986). The warmth a parent provides to a child has been associated with lower levels of both externalizing (Eisenberg, Losoya, Guthrie, Murphy, Shepard, Padgett, Fabes, Poulin, & Reiser, 2001; Moris, Meesters, & van den Berg, 2003; Saltaris, et al., 2004; Yeung, et al., 2002; Zhou, Eisenberg, Losoya, Fabes, Reiser, Guthrie, Murphy, Cumberland, & Shepard, 2002) and internalizing (Minden, 1999; Moris, et al., 2003; Saltaris, et al., 2004) behavior problems. Conversely, parenting behaviors that are lacking in warmth have been associated with greater behavior problems in children. For example, maternal criticism has been found to be related to externalizing behavior problems in both healthy children and children living with a chronic illness (Minden, 1999).

Parental warmth appears to have similar influences on children living with a chronic illness and children that are not living with a chronic illness. Low levels of maternal warmth have been found to be related to internalizing behavior problems in both healthy children and children living with a chronic illness (Minden, 1999).

There has been some support for the buffering of parental warmth on behavior problems in children living with recurrent otitis media (Lopez, 1998).

Parental warmth is not only linked to a lower incidence of child behavior problems, but is also associated with additional positive outcomes in children. Parental warmth shown towards a child may help to promote emotional security (Eisenberg, et al., 2001) and appropriate emotional expression by the child (Eisenberg, et al., 2001; Zhou, et al., 2002). Parental warmth also may decrease levels of depression in adolescents (Gil-Rivas, Greenberger, Chen, & Lopez-Lena, 2003), and may be related to better school grades and more positive child beliefs about their competence (Juang & Silbereisen, 2002).

Parental involvement.

Parental involvement in activities with children is vital to educate and socialize the child to the world (Moore, Chalk, Scarpa, & Vandivere, 2002). Additionally, the parent-child interaction is satisfying to both child and parent alike (Moore, et al., 2002). This satisfying interaction has been found to translate into better behavior in children (Mosley & Thomson, 1995; Thomson, Hanson, & McLanahan, 1994).

Many national data sets have examined parental involvement and children's behavior. Positive parental involvement, such as private talks and engaging in activities together, has been found to be significantly associated with fewer child behavior problems in the National Survey of Families and Household data set (Amato & Rivera, 1999). Additionally, data from the National Longitudinal Survey

of Youth indicates that adolescents who have fun with their family (e.g., playing games, going to sporting events) have fewer behavior problems (Moore, et al., 2002).

Longitudinal research also points to the positive effects of parental involvement. In a longitudinal multi-site study, mothers (n=585; 80 percent Caucasian, 12 percent African American, 2 percent other; predominantly middle class) completed measures about their children in kindergarten and again in sixth grade (Pettit, et al., 1997). The results indicate that supportive parenting, which includes involvement and warmth, has been found to be predictive of children's behavioral, social, and academic adjustment (Pettit, et al. 1997).

Research on parental involvement and chronic illness focuses on time spent managing the illness, not on parent-child activities (McCubbin, 1988). Although the literature is absent, two alternative hypotheses about parental involvement concerning activities may be viable. One, parents may have less time to participate in activities with children due to the time demands of the medical regimen. Two, parents may spend more time involved in parent-child activities to normalize the experience of the child living with a chronic illness. Clearly, further research that separates parents' activity involvement and time spent on the chronic illness regimen is needed to fill this gap in the literature.

Social Support

There are a number of concepts of social support, including perceived social support. Barrera (1986) defined perceived social support as an individual's cognitive appraisal of his or her connection to others. Thus perceived social support refers to

the perception of available or provided social resources an individual accesses in interpersonal relationships in both informal and formal relationships (Cohen, Gottlieb, & Underwood, 2001; Cooke, Rossman, McCubbin, & Patterson, 1988). Social support has been found to act as a buffer against life stress, especially when the social support is operationalized as perceived availability of support (Jackson, 1992).

Social support and buffering of stress.

Cohen and Wills (1985) found evidence for the presence of the buffering effect of social support if the measure used to assess social support taps the individual's perceived availability of resources that are needed to cope with a stressful event. Thus if perceived social support is available and regarded as helpful to an individual, the support can buffer or moderate the negative effects of the stressor. The social support buffering process may prevent individuals from perceiving a situation as stressful or may deter individuals from reacting in a maladaptive fashion (Stets, 1991).

Examples of the buffering effect of social support have been found in previous research. Higher levels of social support have been shown to act as a buffer/moderator against depression for older adults (Hyers, 1995) and in individuals faced with severe illness-related disabilities, such as blindness resulting from complications of diabetes (Littlefield, Rodin, Murray, & Craven, 1990). Research also indicates that social support networks involving friends, neighbors, and extended family directly and indirectly influence parenting and act as a

buffer/moderator against parental psychological distress (Belsky, 1984; Belsky & Vondra, 1989).

Conversely, social support has not always been found to buffer against the influence of stressful life events. For example, formal and informal supports did not buffer the negative effects of economic strain, single-parent families, long work hours, and neighborhood problems on parental well-being for 929 nationally representative families who participated in the National Commission on Children 1990 survey (Voydanoff & Donnelly, 1998). The failure of social support to buffer the stress may be due to the type of stressor and support received. Emotional support from friends will not decrease long work hours or improve neighborhood problems. Likewise, instrumental support provided by others may not be enough to decrease severe economic strains.

Social support and chronic illness.

Whether social support buffers stress or not, research has shown that social support is a resiliency factor for children, adults, and families living with and without a chronic illness (Garwick & Millar, 1996; Jacelon, 1997; Mandleco & Peery, 2000; McCubbin & McCubbin, 1996; Tak & McCubbin, 2002). For example, social support is a commonly used coping strategy for parents living with a child with hemophilia (Miller, Sabin, Goldman, Clemente, Sadowski, Taylor, & Lee, 2000). Parents want and need support for dealing with the uncertainty of the condition's trajectory (Asmussen, et al., 1999; Swallow & Jacoby, 2001). Therefore, living without social support may prevent the family from coping successfully with the

illness. The social support for families living with a chronic illness may come from within the family system through spousal support or from the extended family. Medical professionals, friends, and the community can also provide social support for such families.

In general spousal support can help families get through tough times. In families living with a chronic illness, spousal support has been found to be very important (Barbarin, Hughes & Chesler, 1985). For example, spousal social support has been found to moderate the influence of economic strain on the positive parenting of mothers (Simons, et al., 1992). However, some mothers have reported that the social support provided by grandparents, friends, and families living with a similar condition are more helpful than father support (Tannila, Jarvelin, & Kokkonen, 1999).

Social support from extended family has been found to be helpful for both parents and children. Support provided by grandparents of children living with chronic conditions has been found to be helpful to all in the family (Schilmoeller & Baranowski, 2003). Parents living with a child with blood disorders (sickle cell anemia or thalassaemia) have reported the importance of various dimensions of social support -- practical, emotional, and financial -- from family members in helping them to deal with the challenges created by the chronic illness (Atkin & Ahmad, 2000). In research on childhood cancer, social support from extended family included sibling care, transportation, parent respite, and emotional supports (McCubbin, Balling, Possin, Frierdich & Bryne, 2002). These supports have helped

the parents to cope with the care needed for their children (Atkin & Ahmad, 2000). The support that families experience from others may moderate the relationship between illness presence and other individual processes such as challenges created by child health stress or parental psychological distress.

Medical professionals may also provide social support to families and individuals. Parents want and need to be educated about the illnesses their children are diagnosed with (Asmussen, et al., 1999). The information doctors provide is often a form of instrumental support. Patterson (1991) found that creating a collaborative relationship, a form of support, with medical professionals acts as a resiliency factor. For example, medical professionals have helped parents of children with sickle cell disorder or thalassaemia to reduce stress and improve coping by offering the parents' information, financial help, and emotional support (Atkin & Ahmad, 2000). Similarly, oncology teams that provided families with support in the form of reassurance, hope, information, and assistance improved family adaptation and coping (McCubbin, et al., 2002). The support that comes from the medical profession may help to buffer or moderate the influence of child health stresses on parental psychological distress or child behavior problems.

Friends have been found to provide support to families living with a chronic illness. Of particular assistance to families is the support provided by other families living with the same condition (Tannila, et al., 1999). Unfortunately, some parents find that friends not living with a child with an illness are not understanding of the challenges that are created due to the illness (Asmussen, et al., 1999). Perceived

social support that is provided by friends may help to moderate the stresses created by the illness.

The workplace and community in which the family lives may also be sources of social support. Fellow employees, employers, and employment policies may be forms of support. In families with children living with cancer, parents found flexible schedules, time off, and job assurance to be supportive factors (McCubbin, et al., 2002). Communities can also provide support to families living with a chronic illness through resources such as schools, programs for children, and health care centers (Mandleco & Peery, 2000). In addition, members of the community may provide childcare, financial aid, assistance in home maintenance, and emotional support (McCubbin, et al., 2002). The presence of these supports may buffer institutional stresses that can be created by the presence of illness (e.g., daycare centers that do not accept children who are living with a chronic illness).

Research has also examined the differences between families living with and without a chronic illness in relation to social support levels. The research is mixed, with some finding similar levels of support in both controls and families living with a child with a chronic illness (Cadman, et al., 1991; Gerhardt, et al., 2003), and other research finding significant differences between the social support levels of the two groups (Ellerton, et al., 1996; Holroyd & Guthrie, 1986). Sheer numbers may not tell the whole story; it is possible that families living with a chronic illness may have a smaller, but more effective support group for their needs. The presence of supports

for families living with a chronic illness may help to buffer the possible negative influences of the presence of illness on family and individual processes.

Social support and economic strain.

Families living with economic strain and low incomes have been found to have less perceived social support than families with higher incomes (Klebanov, et al., 1994). This relationship is unfortunate because social support has been found to have a beneficial impact on parenting for economically disadvantaged mothers (Ceballo & McLoyd, 2002). Simons et al. (1993) found that support from a spouse buffers or moderates the relationship between economic strain and depression, and the relationship between depression and parenting behaviors.

Social support and parental psychological distress.

Research has indicated a relationship between social support and parental psychological distress. Lower levels of support are related to higher levels of depressive symptomatology (Dean, Lin, & Ensel, 1981; Reinherz, Giaconia, Wasserman, Silverman, & Burton, 1999; Turner, 1981; Zimmerman, Ramirez-Valles, Zapert, & Maton, 2000). Parents who are satisfied with their current level of support have higher levels of well-being (King, King, Rosenbaum, & Goffin, 1999). Thus, support may moderate the relationship between stress and well-being with higher levels of support creating a buffer against the negative influence of stress on well-being.

Social support and parenting behaviors.

The presence of social support has also been found to positively influence parenting behaviors. Emotional forms of social support have been found to be related to nurturing behaviors in parent-child relationships, whereas instrumental social support can lead to less punitive parenting (Ceballo & McLoyd, 2002). Specifically, spousal support is an important influence on positive parenting behaviors (Simons, et al., 1993; Simons, et al., 1992). Higher levels of social support may buffer external stresses that would decrease positive parenting behaviors. When lower levels of social support are present, the external stressors may decrease positive parenting behaviors. Positive parenting behaviors have been linked to a decrease in child behavior problems and thus social support may also indirectly promote positive functioning in children through the improvement of parental well-being (Ceballo & McLoyd, 2002).

Social support, chronic illness, and children's adjustment.

Parents may receive the majority of support, but children have also been found to benefit from social support. Social support for children living with a chronic illness has been received by friends both prior to and post diagnosis (Tannila, et al., 1999). The support that is received has been found to lead to better adjustment (Amer, 1999; Wallander & Varni, 1989) and fewer behavior problems if the children have social support from both family and peers (Wallander & Varni, 1989). Social support may buffer or moderate the stresses that are created by the presence of illness in children leading to better adjustment and fewer behavior

problems. Unfortunately, some research indicates that children living with a chronic illness have smaller support and peer networks than healthy children (Ellerton, et al., 1996). Nevertheless, any support provided to the child and family may assist with adaptation and buffering or moderating stress.

Definitions

The following are definitions of concepts used in the current research.

Chronic illness: "includes those diseases involving a protracted course that may be fatal or result in compromised mental, cognitive and/or physical functioning and that are often characterized by acute complications, which may result in hospitalizations or other forms of intensive treatment" (Brown & DuPaul, 1999, p. 175).

Economic strain: "refers to the subjective evaluation of one's financial situation" (Voydanoff & Donnelly, 1998, p. 346) and may be marked by a lack of financial resources such as not having enough money at the end of the month, postponing family purchases, and not having health insurance.

Health stress: refers to the child's activity limitations, school absences, school work difficulties created by a physical or mental limitation and/or a general poor rating of health by the child's parent.

Parental psychological distress: refers the presence of depression and/or anxiety.

Parental cognitive stimulation: refers to the parental, family and environmental factors (e.g., involvement) that promote children's learning and understanding of the world around them as well as greater achievement in school.

Parental emotional support: refers to the interpersonal interaction (e.g., discipline, time spent together, and verbal responses) between family members, particularly the parent, and the child.

Parental warmth: is the parent's demonstrative interaction, physical affection, and time spent in positive discussions with a child (Peterson & Zill, 1986).

Parental involvement: are the behavioral parent-child interactions both within and outside the home (e.g., household chores, sports, shopping).

Child behavior problems: are behaviors (e.g., impulsivity, disobedience, and cheating) or emotional expressions (e.g., anxious, tense, and feels worthless) that are disruptive to the child and/or family.

Social support: refers to the perception of available or provided social resources an individual can access in both informal and formal interpersonal relationships (Cohen, et al., 2001; Cooke, et al., 1988).

Hypotheses

Based on the previous research, 13 hypotheses were created to describe the predicted relationships between the presence of a chronic illness, economic strain, child health stress, parental psychological distress, parental cognitive stimulation, parental emotional support, parental warmth, parental involvement, child behavior problems, and social support.

1. The presence of a chronic illness has a positive influence on economic strain.
2. The presence of a chronic illness has a positive influence on child's health stress.
3. The presence of a chronic illness has a direct and positive effect on parental psychological distress.
4. The presence of a chronic illness has a direct and positive effect on child behavior problems.
5. Higher levels of economic strain increase parental psychological distress.
6. Higher levels of child health stress increase parental psychological distress.
7. Economic strain leads to a decrease in parental cognitive stimulation.
8. Economic strain leads to a decrease in parental involvement.
9. Higher levels of child health stress lead to an increase in child behavior problems.
10. Higher levels of parental psychological distress negatively influence all parenting behaviors: parental cognitive stimulation, parental emotional support, parental warmth, and parental involvement.
11. Higher levels of parental psychological distress increase child behavior problems.
12. Higher levels of parental involvement, warmth, emotional support, and cognitive stimulation lead to a decrease in child behavior problems.
13. Mid to high levels of social support moderates each of the following relations: illness to economic stress, child health stress, parental distress, and

child behavior problems; economic strain to parental well-being, parental cognitive stimulation, and parental involvement; child health stress to parental psychological distress and child behavior problems; parental psychological distress to parental cognitive stimulation, parental emotional support, parental warmth, parental involvement, and child behavior problems; parental cognitive stimulation to child behavior problems; parental emotional support to child behavior problems; parental warmth to child behavior problems; and parental involvement to child behavior problems.

Chapter III: Method

Participants

The Panel Study of Income Dynamics (PSID) Child Development Supplement is the data source for the current research. The PSID is conducted by the University of Michigan, Survey Research Center, Institute for Social Research and has been funded over the years by government agencies, foundations, and organizations (Hofferth, Davis-Kean, Davis, & Finkelstein, 1997). The original PSID sample was created from the combination of the Survey Research Center and Survey of Economic Opportunity participants. The Survey Research Center sample used equal probability sampling of households from the 48 contiguous states and had 3,000 participants. The Bureau of the Census for the Office of Economic Opportunity conducted the Survey of Economic Opportunity from which the PSID included approximately 2,000 low income, primarily African-American families with heads of household under the age of 60.

In 1968 the PSID was begun with a representative sample of 5,000 families to obtain information about family economics and structure; marriage, divorce, birth, and death rates; and health (Hofferth, et al., 1997). By 1996 the sample had grown to 8,700 families due to the expansion of the initial sample and the subsequent families that formed from aging children. In 1997, as a cost saving measure the PSID reduced this core sample by eliminating participants from the Survey of Economic Opportunity sample by two-thirds. However, due to the introduction of additional funding, 609 African-American families from the Survey of Economic

Opportunity were able to be retained (Hofferth, et al., 1997). The refreshed sample also included a new sample of post 1968 immigrant families (n=441). The addition of the immigrant sample and the reduction of the original core sample created a sample that is representative of the United States population.

The PSID survey was conducted yearly until 1997 when it began to be collected biennially (Hofferth, et al., 1997). In 1997, the PSID included the Child Development Supplement, which expanded the survey to include questions aimed at understanding the growth and development of children (Hofferth, 1998). Families with children below the age of 13 were asked to participate (Hofferth, 1998). There were 2,705 families eligible for participation; of that group, 2,394 families that included 3,563 children completed the supplement (Institute for Social Research, 2002). The response rate for the supplement was 88.2 percent (Institute for Social Research, 2002).

The sample for this research was limited to families with children six years and older, thus excluding 1,610 children from the initial sample. Of the remaining 1,953 children, 16 were eliminated from analysis because their primary caregivers stated that doctors had reported that their child had either autism (n = 6) or retardation (n = 10). Both autism and retardation were not included in the sample because of the additional caregiving requirements necessary when a child is living with cognitive difficulties.

Further sibling reductions of the sample were also conducted. The sample consists of 438 sibling pairs. One of the siblings was eliminated to avoid double

counting. Three sibling pair types were present, two children not living with a chronic illness (n=214), one child with and one child living without a chronic illness (n=141), and two children living with a chronic illness (n=83). Siblings in homogeneous pairs were alternately sampled (e.g., youngest then oldest and so on). Sibling pairs that had one child living with and one child living without an illness did not follow the previous sampling methods. Instead the child with the chronic illness was retained in order to maintain an adequate chronic illness sample size.

After deletions, the final sample that was analyzed consisted of 1,500 children and is a representative sample of children living in the United States in 1997, ages six to twelve, who do not have autism or retardation. However when the normalized weight was applied to the sample a case was deleted from analysis. This is most likely a result of rounding error. If the weight was taken out to additional decimal places, making the weight more exact, the case might not have been deleted. Nonetheless the final sample included 1,499 children.

The entire sample (n=1,499) was split into two groups, families that report a chronic illness (asthma, anemia, diabetes, and otitis media; n= 693) and those that do not (n=806). Previous research has combined similar illnesses into one group for analysis (Dadds, Stein, & Silver, 1995). In the current research the presence of chronic illness is indicated by the reports of primary caregivers to the question; “Has your doctor or health professional ever said that (CHILD) had…asthma, diabetes, more than three ear infections in a year, or anemia or iron deficiency?” If the caregiver answered affirmatively to any of the illnesses, the family was included in

the chronic illness group. These physical health questions have been used previously in the National Longitudinal Survey of Children and Youth, National Longitudinal Survey of Youth, and National Health Interview Survey (Hofferth, et al., 1997).

In the PSID Child Development Supplement there are a total of 693 children that are included in the chronic illness sample. Of those children, 120 are living with anemia (8 percent of the total sample), 157 are living with asthma (10.5 percent), 3 are living with diabetes (0.2 percent), and 522 are living with chronic otitis media (34.9 percent).

In the current sample comorbidity of chronic illnesses is present. Of the 693 children, 588 reported only one chronic illness (39.2 percent of total sample and 84.7 percent of chronic sample), 102 reported two chronic illnesses (6.8 percent of total sample and 14.7 percent of chronic sample), and 4 reported three chronic illnesses (0.3 percent of total sample and 0.6 percent of chronic sample). Chronic otitis media has the greatest comorbidity with 106 children living with chronic otitis media and at least one other illness.

Table 1

Sample Rate of Chronic Illness

Chronic illness	Number of children	Percentage of chronic illness sample (n=693)	Percentage of total sample (N=1,499)
Anemia	120	17.3	8.0
Asthma	157	22.6	10.5
Diabetes	3	0.4	0.2
Otitis Media	522	75.2	34.9

National prevalence rates differ only slightly from the rates found in the current data. Between 1999 and 2000, approximately four percent of children between the ages of 6 and 11 were living with anemia (Centers for Disease Control and Prevention, 2002). Currently there are nine million children (12 percent), under the age of 18, who have been diagnosed with asthma (Blackwell, Vickerie & Wondima, 2003). Juvenile onset diabetes affects 151,000 children (0.19 percent) under the age of 20 or about one in every 400 to 500 children (National Institutes of Diabetes & Digestive & Kidney Disorders, 2003). Ear infections affect 24.6 percent of children under the age of 18 (Coiro, Zill & Bloom, 1994). The current sample has more children with chronic ear infections than the national percentage. This may be due to the age range included in the national sample. Adolescent children may be less likely to have ear infections than younger school age children.

Asthma, anemia, diabetes, and chronic otitis media are the illnesses that are examined based on shared attributes. First, each of the illnesses can manifest during childhood. Second, each of the illnesses is invisible to individuals outside of the family. Thus there are no stigmatizing changes in appearance, providing the family and child with discretion regarding whom to inform about the presence of the illness. Third, each of the illnesses can have acute episodes followed by chronic periods that require regular monitoring. Fourth, medication is required to treat each of the illnesses. Fifth, each of the illnesses can cause permanent injury to the child if not monitored appropriately.

Procedure

Families first completed the traditional PSID measures. From these measures researchers determined the eligibility of family participation for the Child Development Supplement based on the ages of the children. Eligible families were told by the PSID interviewer that they would be contacted in the future about the Child Development Supplement. Families with one or more children age 12 and younger were eligible to participate. If the family had more than two children within the desired age range, the central office of the PSID randomly selected two children for the measures to be given, and determined the likely primary caregiver. Children living with or without a chronic illness allhad equal chances of being included in the total PSID-CDS sample.

Field researchers after family's eligibility was determined and the Child Development Supplement was explained, the researchers identified the primary caregiver, scheduled a time for the interview, and mailed an introductory letter (see Appendix A). The researcher met the primary caregiver at the household to obtain written permission for the child interview, assess the child using standardized achievement tests and, if old enough (eight years and older), to complete child interviews. Also while in the home, the researcher conducted the primary caregiver child interview and assessment, collected the time use diaries, and provided additional self-administered instruments for the primary and other caregivers to complete. The interviewer also completed observations of the primary caregivers interaction with the child and the home environment for the HOME measure. After

completion of the interview, primary caregivers were given a small token of appreciation for their participation and the children were given a small gift. Completed interviews and self-administered questionnaires were mailed to the Survey Research Center, Institute for Social Research central office for coding and entered into a database by the SRC Survey Services Lab.

The questionnaires used in the PSID Child Development Supplement were developed over 11 months and pretested twice (Institute for Social Research, 2002). The first pretest was conducted by the Survey Research Center in June 1996 for the household questionnaire. The second pretest in October 1996 was a rehearsal of the entire PSID and Child Development Supplement, including all interviews and mailings. In January 1997, the pretests were concluded and the data collection begun.

Instruments

The instruments used in the current research come from two questionnaires that were given to participants in the Child Development Supplement (Hofferth, et al., 1997). The first questionnaire is the Primary Caregiver Child Questionnaire that was completed by the primary caregiver either with the interviewer face to face or over the phone. The second is the Primary Caregiver Household Questionnaire that was also completed by the primary caregiver, but was self-administered in the home. However, if literacy or language problems were present, the interviewer administered the questionnaire.

Economic strain.

The economic strain index (see Appendix B) focuses on subjective financial stress and how the individual or family responds to those financial pressures (Conger & Elder, 1994). Participants were asked to indicate the financial stresses they experienced within the last year. The measure has 15 different responses to financial stress ranging from “postponed major purchases” to “sent one or more of your children to live with someone else.” Individuals not experiencing financial stresses indicated "none of the above."

Two additional questions that were constructed by the Institute for Social Research (2002) were added to the economic strain index by the author. The first additional question assesses the money families have at the end of the month. The questions asks, "At the end of the month, do you end up with some money left over, just enough to make ends meet, or not enough money to make ends meet?" Participants may respond that they have either some money left over, just enough to make ends meet, or not enough to make ends meet. The responses were dichotomized to reflect the yes/no response set of the economic strain measure. Therefore, the responses "either some money left over or just enough to make ends meet" were coded no or zero, and "not enough to make ends meet" was coded yes or one indicating economic strain. This question was added to the economic strain index because it may capture families that are beginning to experience economic strain. To ensure that the question is related to the economic strain index, a

Pearson's Product-Moment correlation was conducted revealing a statistically significant relationship (r=.46, p<.001).

The second question added to the economic strain index assesses the presence of health insurance. Primary caregivers answered the question, "How many of the past 12 months was (CHILD) covered by health insurance or any other kind of health care plan? Include health insurance obtained through employment or purchased directly as well as government programs like Medicare and Medicaid." If a child was not covered by health insurance during any of the past 12 months a score of one was assigned, indicating the presence of economic strain. If a child was covered by insurance for the entire previous year a score of zero was given. This question was added to tap the economic strain families might experience if their child did not have health insurance. To insure that the health insurance question is related to the economic strain index a Pearson's Product-Moment correlation was conducted revealing a statistically significant relationship (r=.17, p<.001).

Participants will have a total score ranging between 0 and 17, with higher scores indicating a higher level of economic strain. The index has a high level of face validity and has a Cronbach alpha of 0.70 with the additional questions. If the "money at the end of the month" question is removed, the Cronbach alpha falls to 0.66; and if the health insurance question is removed the Cronbach alpha falls to 0.69. Cronbach alphas were also conducted for children living with a chronic illness (0.70) and children not living with an illness (0.69).

No previous research has used the economic strain index in its entirety. However, Conger and associates used a modified economic strain index and included two additional questions referring to money left over at the end of the month and difficulty in paying bills (Conger, Elder, Lorenz, Conger, Simons, Whitbeck, Huck, & Melby, 1990). The modified index in that research yielded a Cronbach alpha of .84 (Conger, et al., 1990).

Child health stress.

The child health stress index was created for the current research project using questions from the Child Development Supplement (see Appendix C). There are four items that make up the index. The first question asks the parent to rate the child's health as excellent, very good, good, fair, or poor. Children that are rated by their parents to be in fair or poor health may be an indicator of health stresses. The majority of children (97.4 percent) were rated as having either good, very good, or excellent health. Therefore to separate the most extreme scores the question was dichotomized with excellent, very good, and good given a score of zero or no health stress and children rated as fair or poor given a score of one indicating the possibility of health stress.

The next three questions examine activity limitations. Previous research has used activity limitations during the last 12 months and school days missed as a measure of the illness condition (Chernoff, List, DeVet, & Ireys, 2001) and as a measure of response to chronic pain in sickle cell disease (Gil, Carson, Porter, Ready, Valrie, Redding-Lallinger, & Daeschner, 2003). The three questions used the

same stem; does your child “currently have any physical or mental conditions that would limit or prevent the child’s ability to…” The primary caregiver then answers the three questions (1) “do usual childhood activities such as play, or participate in games or sports,” (2) “attend school (preschool or day care) regularly,” and (3) “do regular school work.” The caregiver was asked to respond to each question with either a "yes" or a "no." Yes responses were given a score of one indicating health stress.

For the child health stress index each item was dichotomized, yes or no, with yes answers indicating a stressful health circumstance and given a score of one. "No" responses are given a score of zero or no health stress. The responses to the index are summed, creating a possible range of index scores from zero to four. Higher scores indicate a higher level of child health stress. The Cronbach alpha for the index is 0.59. Additional analysis revealed that the Cronbach alpha for children not living with a chronic illness was 0.74 and for children living with a chronic illness was 0.50.

Parental psychological distress.

Non-specific psychological distress was measured using a ten-item scale referred to as the K10 (see Appendix D) that was developed for the National Health Interview Survey (Kessler, Andrews, Colpe, Hiripi, Mroczek, Normand, Walters, & Zaslavsky, 2002). During the creation of the K10, clinical and community pilot tests were conducted to screen possible questions for inclusion (Kessler, et al., 2002).

Item response theory was used to select the 10 items that are included in the K10 (Kessler, et al., 2002).

The K10 assesses various symptoms of non-specific psychological distress over the past month using a response scale of all of the time (one) to none of the time (five). Items include "during the past 30 days, how often did you feel tired out for no good reason" and "how often did you feel so sad nothing could cheer you up?" Each of the ten questions is reverse coded so that higher item scores indicate more non-specific psychological distress. Scores can range from 10 to 50, and a higher total score indicates greater non-specific psychological distress.

Initial cut-off scores for the K10 have been developed by the Clinical Research Unit for Anxiety and Depression, School of Psychiatry, University of New South Wales (Department of Human Services Center for Population Studies in Epidemiology, 2002). Scores of 10 to 15 indicate low or no risk, 16 to 29 indicate a medium risk, and 30 to 50 indicate a high risk of psychological distress (Department of Human Services Center for Population Studies in Epidemiology, 2002). However, additional research is needed to confirm these cut-off scores.

The K10 has been found to be a valid and reliable measure of psychological distress (Department of Human Services Center for Population Studies in Epidemiology, 2002; Furukawa, Kessler, Slade, & Andrews, 2003; Kessler, et al., 2002; Kessler, Barker, Colpe, Epstein, Gfroerer, Hiripi, Howes, Normand, Manderscheid, Walters, & Zaslavsky, 2003a). The measure is able to detect DSM-IV depressive and anxiety disorders in individuals (Furukawa, et al., 2003) and has

consistent severity values across sociodemographic subsamples (Kessler, et al., 2002). The K10 has also been found to have excellent internal consistency for a nationally representative telephone sample (Cronbach alpha = .92, Kessler, et al. 2002) and a community interview sample (Cronbach alpha = .93, Kessler, et al. 2003a). For the current sample the Cronbach alpha is 0.91. The index's reliability coefficient for children living without a chronic illness was 0.92 and 0.89 for children living with a chronic illness.

Parental cognitive stimulation and parental emotional support.

The Home Observation for Measurement of the Environment (HOME, see Appendix E and F) scale has been used frequently in research to assess the relationship between parent and child, and the resources that are available to the child for play and learning (Caldwell & Bradley, 1984). The scale assesses both parental cognitive stimulation and emotional support that is provided to children.

The PSID Child Development Supplement used a shortened form of the HOME to permit comparison with the National Longitudinal Survey of Youth. The modified HOME inventory items were selected by Bradley and based on reliability and validity coefficients, discrimination indices, and factor loadings from previous research (Baker & Mott, 1989). The shortened form has been found to capture the breadth of the original larger set of questions (Parcel & Menaghan, 1989) and to have a stable factor structure across time (Menaghan & Parcel, 1995).

The measure collects both the primary caregivers' report of available activities to the child and the child’s contact with others, and the interviewer's

observations of the home and the mother-child interaction. The questions in the modified HOME differ slightly based on the child's age in order to tap children's stages of development. Therefore, there are separate forms for children aged 6 through 9 and 10 and older. However, the HOME items and scales are generally comparable across ages (Baker & Mott, 1989).

In the original and modified HOME scale there are three items that discuss contact with a father or father figure. The items state, "about how often does (CHILD) spend time with (his/her) father;" "about how often does (CHILD) spend time with (his/her) father in outdoor activities;" and "how often does (CHILD eat a meal with both mother and father?" These items are excluded from analysis to avoid possible family composition bias.

The two subscales of the modified HOME, parental cognitive stimulation and emotional support are analyzed separately in this research. The parental cognitive stimulation subscale taps the family and environmental factors that may contribute to the cognitive stimulation of the child. There are 14 questions in the scale for 6 through 9 year olds and 13 questions in the 10 and older scale. Examples of items include "how often do you read to your child," and "does your family encourage your child to start and keep doing hobbies?" Also, there are questions that the interviewer answers about the home environment such as, "is the interior of the home dark or perceptually monotonous," and "is the child's play environment safe with no potentially dangerous health or structural hazards within the child's range."

The emotional support subscale examines the interpersonal interaction between the family members, particularly the parent and the child. Items include "most children get so angry at their parents that they say things like 'I hate you' or swear in a tantrum. Please look at this list and tell me which actions you would take if this happened;" and "about how often does our whole family get together with friends or relatives." Interviewers also answered questions pertaining to the primary caregiver's voice quality and whether it conveyed positive feeling toward the child, and if the caregiver spontaneously spoke or conversed with the child. There are 9 questions in the scale for 6 through 9 year olds and 10 questions in the 10 and older scale. The modified HOME is scored by translating each of the items into dichotomous, zero-one variables. The items are then summed.

Scores for the cognitive stimulation subscale range between 0 and 14 for children between the ages of 6 and 9, and 0 and 13 for children 10 and older. Higher scores indicate a higher level of cognitive stimulation provided to the child. Scores on the emotional support scale range between 0 and 9 (6 through 9 year olds) or 10 (10 and older), with higher scores indicating more emotional support.

The HOME has been used previously in many national research studies (Miller & Davis, 1997), and has been used successfully with different ethnic groups within the United States including Caucasians, African Americans, and Mexican Americans (Bradley, et al., 1989). The internal consistency reliabilities for the global measure of the modified HOME in the NLSY data set were 0.69 in 1986 and 0.72 in 1988 (Menaghan & Parcel, 1995).

Internal consistency reliability for the cognitive stimulation subscale has been found to range between 0.50 and 0.72 for children three and older (Baker, Keck, Mott & Quinlan, 1993; Baker & Mott, 1989). The NLSY data reveal internal consistency reliabilities for children 6 to 9 years old as 0.67 and for children 10 and older, 0.62 (Baker, et al., 1993). For the current total sample the Cronbach alpha for children 6 through 9 is 0.58 and 0.56 for children 10 and older. Children living with a chronic illness aged six through nine had a Cronbach alpha of 0.60, and children living without a chronic illness had a Cronbach alpha of 0.64. Children aged 10 and older had a 0.47 Cronbach alpha for children living with a chronic illness, and a 0.66 Cronbach alpha for children not living with a chronic illness.

The internal consistency reliability for the emotional support subscale, for children six and older, has been reported to range between 0.35 and 0.70 (Baker, et al., 1993; Baker & Mott, 1989). The NLSY data indicate internal consistency reliabilities for children 6 to 9 years old as 0.61 and for children 10 and older, 0.58 (Baker, et al., 1993). In the current total sample the Cronbach alpha for children six through nine is 0.56 and 0.53 for children 10 and older. Children living with a chronic illness aged six through nine had a Cronbach alpha of 0.66, and children living without a chronic illness had a Cronbach alpha of 0.55. Children aged 10 and older had a 0.65 Cronbach alpha for children living with a chronic illness, and a 0.76 Cronbach alpha for children not living with a chronic illness.

Parental warmth.

The parental warmth measure (see Appendix G) was created for the National Survey of Children (Peterson & Zill, 1986) and then modified for the PSID-CDS (Hofferth, et al., 1997). The scale has six items that assess the relationship warmth between the caregiver and child. Participants are asked how often they have completed some activity in the past month, such as "told your child you loved them" or hugged and shown affection, "either every day (five), several times a week (four), about once a month (three), one or two times in the past month (two), or not in the past month (one)." Total scores can range between 6 and 30, with higher total scores indicating greater relationship warmth. The Cronbach alpha for parental warmth measure in the current sample is 0.79. The internal reliability for children living with a chronic illness was 0.77, and 0.81 for children not living with a chronic illness.

Parental involvement.

The household activities measure (see Appendix H) was used to assess parental involvement (Sweet, Bumpass & Call, 1988). The measure consists of 13 items that assess parent-child interaction both within and outside the home within the past month. The items include questions that focus on both interactions that do and do not require additional toys or equipment. For instance, questions ask have you "washed or folded clothes together" or "played sports or did outdoor activities together?" Primary caregivers may respond to each of the 13 items with one of five responses: “did not do it in the past month with (CHILD)(one), did it one or two

times in the past month (two), about once a week (three), several times a week (four), or every day (five)." The total scores for the household task measure range from 13 to 65, with higher scores indicating higher parent-child interaction. The Cronbach alpha for the current total sample is 0.76. The chronic illness subgroup has a Cronbach alpha of 0.76 and the nonchronic illness subgroup has a Cronbach alpha of 0.75.

Child behavior problems.

The behavior problems index (Peterson & Zill, 1986) measures the occurrence and severity of child behavior problems when the child is over the age of four (see Appendix I). The index was adapted from the longer Achenbach Behavior Problems Checklist (Achenbach & Edelbrock, 1981). Peterson and Zill (1986) had three criteria for the items that were pulled from the original Achenbach checklist, (1) reliability, (2) high factor loadings on a subscale, and (3) the flexibility of interview sites. Four additional items were added to the Peterson and Zill scale (1986) by the National Longitudinal Survey of Youth staff to gain additional information for the withdrawn, internalizing behavior subscale (Hofferth, et al., 1997).

The behavior problems index asked primary caregivers to decide whether 30 different behaviors or emotional expressions were often true (one), sometimes true (two), or not true about their child (three). Items include, "(he/she) is restless or overly active, cannot sit still" and "(he/she) is withdrawn, does not get involved with others." The items are reverse coded so higher numbers coincide with greater

numbers of behavior problems. The total score for the index can range between 30 and 90, with higher scores indicating higher levels of behavior problems.

The 26 items included in the original Peterson and Zill (1986) index have been found to have good test-retest reliability and discriminant validity (Rogers, Parcel, & Menaghan, 1991). These items have also have been found to have a high internal consistency with Cronbach alphas ranging between .88 and .90 (Rogers, et al., 1991; Parcel & Menaghan, 1993). The Cronbach alpha for the total 30 item index based on the current total sample is 0.90. The chronic illness subgroup has a Cronbach alpha of 0.91 and the nonchronic illness subgroup has a Cronbach alpha of 0.88.

Social support.

Items for the social support index (see Appendix J) were taken from the National Survey on Families and Households and from the 1980 Panel Study of Income Dynamics (Hofferth, et al., 1997). The index taps both instrumental (e.g., transportation, child care, help around the house) and emotional support. Two contingency questions ask participants if they have received instrumental or emotional support in the past month. Participants who respond affirmatively are then asked to choose five people from whom they have received help. Individuals who have had support from more than five people in the previous month are asked to choose those that have helped them the most. Participants may choose from a list of 13 helpers, ranging from relatives (own mother, father; mother-in-law, father-in-law,

grandparents, sister, brother, aunt, uncle, cousin) to friends, clergy, and co-workers. The "other" category was also included.

An individual social support score can range between 0 and 10. A higher index score indicates higher levels of support. Individuals with scores of zero are considered to be without perceived social support within the past month. The social support mean for the entire sample was 3.60; the nonchronic group had a mean score of 3.35 and the chronic group a mean score of 3.91. The difference between the groups was significant ($t(1391) = -3.86$, $p<.001$) with parents of children living with a chronic illness perceiving higher levels of support than parents of children not living with an illness.

The social support variable was dichotomized into two groups for analysis in SEM (Bollen, 1989). The current literature on social support did not provide a clear cut-score for dichotomizing the groups into low and mid to high. Much of the support literature uses Likert scales to assess the intensity and direction of support (Charron-Prochownik & Kovacs, 2000; Dunst, Trivette, & Cross, 1986; Jackson, Gyamfi, Brooks-Gunn, & Blake, 1998; Kaplan & Hartwell, 1987; Wanamaker & Glenwick, 1998). Additionally these studies did not dichotomize, but use social support as a continuous variable.

When no clear theoretical cut-score is present, dichotomizing the data using a median split has been suggested. Previous research has also examined the moderating influence of low and high levels of social support by using a median split

(Simons, et al., 1992; Simons, et al., 1993). Additionally, a median split helps to ensure that the sample size in each group is similar.

The median score for the entire sample and the subsample of no illness was three. The median score for the chronic illness group was four. Therefore, three was chosen as the median cut-score. Thus, individuals with lower levels of perceived social support have scores ranging from 0 to 3, and higher levels of perceived social support range from 4 to 10.

Weights

PSID staff created a weight to be applied to the Child Development Supplement data file that adjusts for the oversampling of African American families, to represent the national population of children. The weight also adjusts for primary caregivers who failed to complete the primary household booklet. The PSID staff created a nonresponse adjustment for the data by "multiplying each weight by the ratio of the sum of weights for the total eligible by the sum of weights for the total interviewed. This nonresponse adjustment was computed separately for each post-stratification cell" (Institute for Social Research, 1999, p. 1).

In order to maintain actual sample sizes the weight must be normalized to avoid bias. The weight was normalized by dividing the weight by its mean (11.07627). This new weight was then applied to the data. Data analysis was completed with the weight applied.

Missing data

The weight that was applied to the data adjusts for instances where the primary caregiver failed to complete entire scales. However, when individual items are missing within a scale, the items that were completed by that individual were averaged and the resulting mean replaced the missing item (Allison, 2002). If individuals are missing more than half of the items on a particular scale, no substitution is applied and the items remain missing for that individual

Statistics

Descriptive analysis.

Descriptive statistics, such as frequencies, means, and standard deviations were used to summarize the demographic information of families, using the SPSS 11.0 statistical package. The demographic variables that were analyzed include age, race, and gender of child; age, race, gender, education, and current employment status of the head of the household; the age, race, gender, education, and current employment status of the spouse; the number of children in the household under the age of 18; the family's total income; the family's poverty level status; and the family structure. Demographic information was further analyzed by comparing characteristics of the two groups, chronic illness and no illness, using independent *t*-tests for continuous data and Chi-square tests for nominal data analysis. Additionally, Pearson's Product-Moment correlation coefficients were computed to examine the relationships among all variables. The education of the head of the

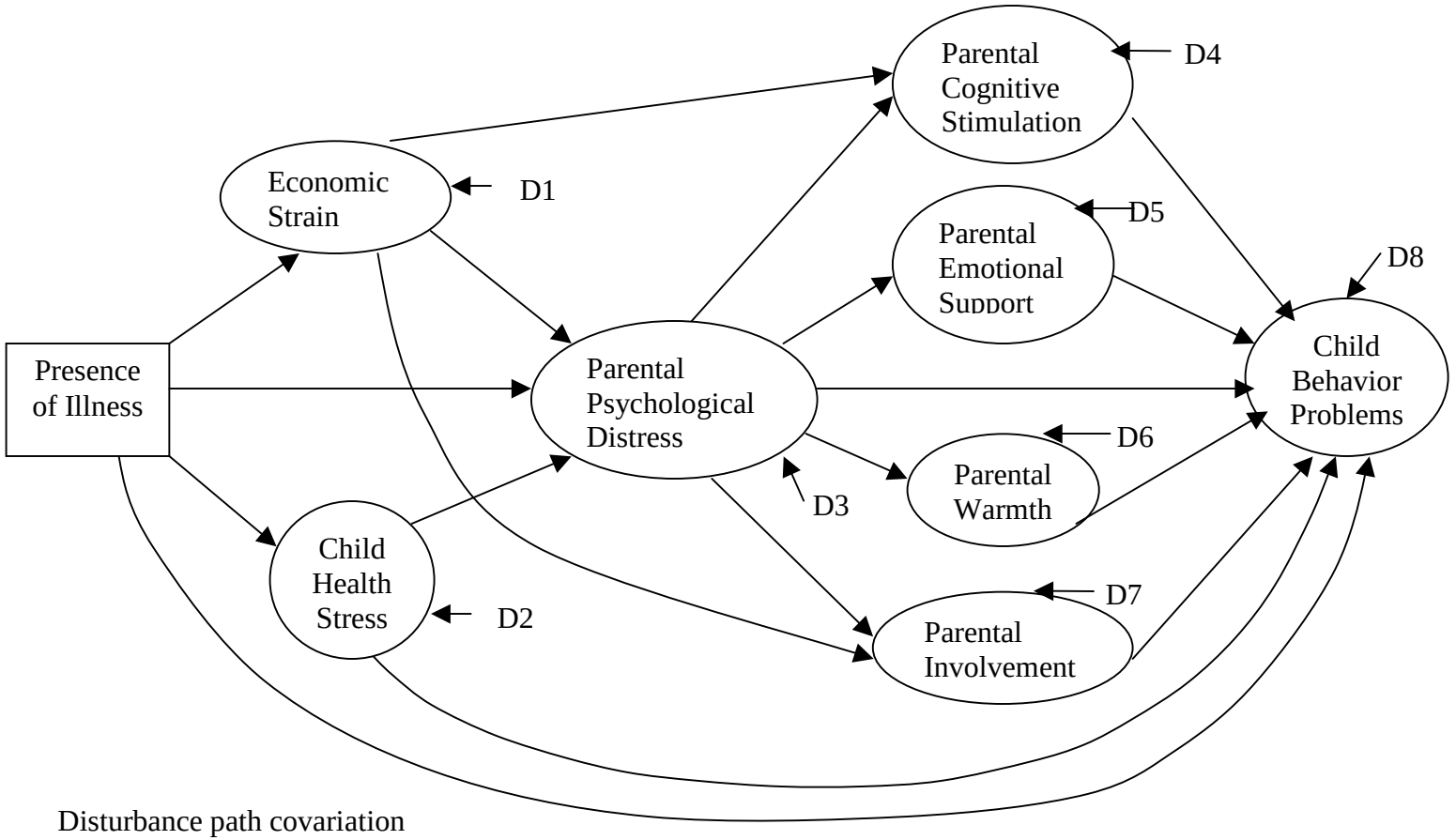
household and the number of children under the age of 18 living in the household were controlled for during multivariate analysis.

Multivariate analysis.

Structural equation modeling (SEM) is the chosen method for examining the current data and was chosen for many reasons. First, SEM has more flexible assumptions, such as permitting multicollinearity, than multiple regression (Garson, 2003). Second, SEM has the ability to test the entire model simultaneously rather than each of the coefficients individually, as in regression (Garson, 2003; Peyrot, 1996). Third, SEM can test models with multiple dependent variables (Garson, 2003). Fourth, SEM permits the modeling of multiple mediating variables (Garson, 2003). This modeling allows for examination of mediating variables in a causal, multilevel additive fashion. Fifth, SEM has the ability to examine the effect of moderator variables for each of the variable paths (Garson, 2003). Sixth, error terms are modeled, measured, and can be correlated in SEM (Chen & Land, 1986; Garson, 2003). SEM allows for disattenuation of measurement error either by having multiple indicators of factors or by building in reliability corrections for single indicators. Seventh, SEM expands analysis to include indirect relationships (Peyrot, 1996). Indirect relationships can be assessed by examining "the sum of the compound paths" that connect the two variables (Loehlin, 1998, p. 9). If SEM is not utilized, significant indirect effects may be missed (Peyrot, 1996). Eighth and finally, SEM permits the testing of coefficients across multiple between-subject groups (Garson, 2003).

Structural equation models specify the relationship among variables that are based on theory and previous research (Lavee, 1988). The arrows or paths between variables explain which variables are directly and indirectly related (Loehlin, 1998). Double-headed arrows indicate covariation paths. The path coefficients that are created through EQS indicate the strength and direction of the relationship between the variables (Loehlin, 1998).

Figure 3 illustrates the model evaluated in this research. The only exogenous variable in the model is the presence of chronic illness. The remaining variables are endogenous and, with the exception of child behavior problems, are mediating as well. The moderating effects of social support are analyzed by examining the effect of low versus mid to high levels of social support on each of the above paths. Each of the paths present in the model is tested across the two groups to assess if the level of support moderates the relationship between factors.



Disturbance path covariation

D1 ↔ D2 D4 ↔ D6 D5 ↔ D6
D4 ↔ D5 D4 ↔ D7 D5 ↔ D7
D6 ↔ D7

Figure 3: Structural Equation Model

The model indicates that the presence of a chronic illness directly influences economic strain, child health stress, parental psychological distress, and child behavior problems. Parenting behaviors are indirectly influenced by the presence of chronic illness through the mediating variables of economic strain, child health stress, and parental psychological distress. Economic strain is directly linked to parental psychological distress, parental cognitive stimulation, and parental involvement. Covariation is only acceptable in independent variables in SEM; therefore to indicate the possible correlation between economic strain and child health stress the disturbance paths were made to covary (Loehlin, 1998). Economic strain is indirectly linked to parental emotional support and warmth, and child behavior problems. Child health stress is directly related to parental psychological distress and child behavior problems. The parenting variables are indirectly linked to health stress. Parental psychological distress is directly linked to all four parenting variables and child behavior problems. The four parenting variables (parental cognitive stimulation, parental emotional support, parental warmth, and parental involvement) are all directly related to child behavior problems. To indicate the possible correlation between parenting behaviors, all of the disturbance paths of the parenting behaviors are made to covary.

Participant index or scale totals were calculated for economic strain, child health stress, family conflict, parental well being, parental warmth, parental cognitive stimulation, parental emotional support, parental warmth, parental involvement, and child behavior problems. Each of the scale totals acts as observed

indicators of the given variable and "are assumed to correspond exactly with their underlying constructs" (Garrett, et al., 1994, p. 152). For example, the scale score for child health stress serves as the observed measurement of the child health stress variable. Unfortunately, single indicators of a variable express no measurement error, but in reality may be error ridden (Kline, 1998). To correct for this problem, error variance was estimated by subtracting the scale's Cronbach alpha from 1 and then multiplying by the scale's total variance ((1-α)(variance)). The inclusion of the estimated error variance then creates a latent variable from the observed indicator. See Figure 4 for a pictorial transformation of the variable.

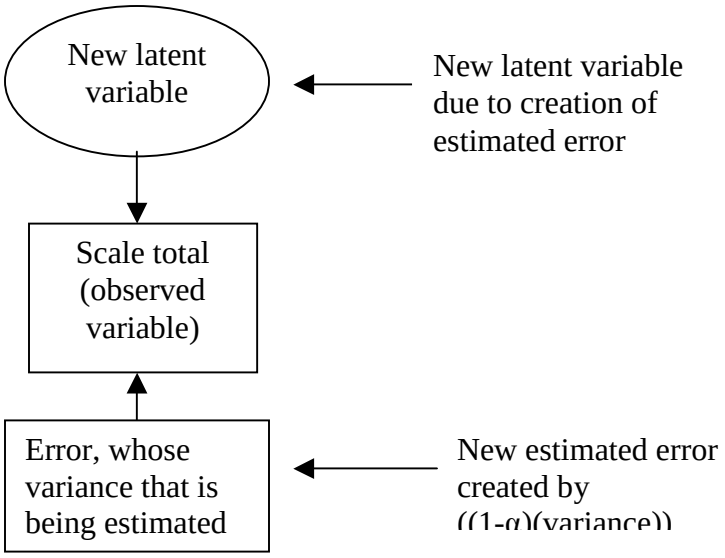


Figure 4: Transformation of Observed Variables to Latent Variables

This error correction was completed for economic strain, health stress, parental psychological distress, parental cognitive stimulation, parental emotional support, parental warmth, parental involvement, and child behavior problems.

In order to obtain error variances for parental cognitive stimulation and emotional support one alpha that collapsed the age groups had to be created. To do this each of the items were analyzed for similarity in wording and scoring across the two age groups. Of the items, only two were specific to the two age groups. One item, "how often do you read to (CHILD)?" applied only to the six through nine year old group. The second item, "How often is (CHILD) expected to do each of the following: pick up after (himself/herself)?" pertained only to the 10 and older group. Therefore, these two items were removed from the analysis of Cronbach alphas in order to create one error variance for both groups.

A structural equation model with an observed variable (presence of chronic illness) and latent factors was analyzed using maximum likelihood estimation. Maximum likelihood estimation was used because it has been found to be robust when normality assumptions are violated (Newcomb & Bentler, 1988). The latent factors were run simultaneously with the structural equation model in the EQS structural equation program (Bentler, 1997). Each of the variables has only one indicator; therefore the measurement model would have fit perfectly and was not run. Only the structural model was run.

The structural model, as seen previously in Figure 3, was applied to the data. Next the model fit was assessed in order to retain the appropriate model and reject an unsuitable model. Fit was assessed using Hu and Bentler's (1999) joint fit criteria. Hu and Bentler (1999) recommended assessing model fit on two criteria simultaneously, such as Bentler's Comparative Fit Index (CFI) of 0.96 or larger and

Standardized Root Mean-square Residual (SRMR) of 0.10 or smaller; or the Steiger and Lind Root Mean-Square Error of Approximation (RMSEA) of .06 or smaller and the previously mentioned CFI may also be used for joint fit criteria.

After the structural model was run for the entire sample, the moderation of social support was explored using multigroup structural equation models to analyze the two groups of low and mid to high levels of social support. Model fit was assessed for each model (low and mid-high levels of social support). Next each path was constrained individually (e.g., made to have the same coefficients for both groups). If the constrained path was significant at the .05 level in the Lagrange Multiplier Test for Constraints, the constraint was considered not tenable due to group differences. If the constrained path was not significant, the constraint was considered tenable for both groups. Each of the paths in the model was run in this manner. Thus, the final structural equation model has paths that are constrained and similar across groups, and/or paths that differ for the two groups with separate loadings or paths for each.

Chapter 4: Results

Demographic characteristics

Participants.

The sample consisted of a total of 1,499 children, 693 (46.2 percent) living with a chronic illness and 806 (53.8 percent) not living with a chronic illness. Of the 693 children living with a chronic illness, 587 reported only one chronic illness (39.2 percent of total sample and 84.7 percent of chronic sample), 102 reported two chronic illnesses (6.8 percent and 14.7 percent), and 4 reported three chronic illnesses (0.3 percent and 0.6 percent). The numbers of children living with individual illnesses include 120 living with anemia (8 percent of the total sample and 17.3 percent of chronic sample), 157 living with asthma (10.5 percent and 22.6 percent), 3 living with diabetes (0.2 percent and 0.4 percent), and 522 living with chronic otitis media (34.9 percent and 75.3 percent). Chronic otitis media has the greatest comorbidity with 106 children living with chronic otitis media and at least one other illness.

The demographic characteristics of the children are presented in Table 2. The children ranged in age from 6 to 13.6 with a mean age of 9.5 years. There are 709 (47.3%) male and 790 (52.7%) female children in the sample. The majority of the children are Caucasian (n=1062, 70.9%) followed by African American (n=181, 12.1%), Hispanic (n=150, 10.0%), Asian (n=50, 3.4%), Native American (n=14, 0.9%), and finally other (n=42, 2.8%).

Table 2: Child Demographics (N = 1,499)

	Total Mean (SD)	Range	Chronic Mean (SD)	Nonchronic Mean (SD)
Age	9.5 (2.2)	6-13.6	9.4 (2.1)	9.6 (2.2)
	N (%)		N (%)	N(%)
Gender				
Male	709 (47.3%)		369 (53.2%)	341 (42.3%)
Female	790 (52.7%)		324 (46.8%)	465 (57.7%)
Race				
Caucasian	1062 (70.9%)		486 (70.1%)	576 (71.5%)
African American	181 (12.1%)		97 (14.0%)	84 (10.4%)
Hispanic	150 (10.0%)		69 (10.0%)	80 (9.9%)
Asian	50 (3.4%)		13 (1.9%)	38 (4.7%)
Native American	14 (0.9%)		7 (0.1%)	7 (0.9%)
Other	42 (2.8%)		21 (3.0%)	21 (2.6%)

The demographic characteristics of the parents are presented in Table 3. The majority of households were headed by men (n=1430, 95.6%) and have two parents (n=1410, 94.0%). Eighty nine (6.0%) families are considered "other," or not a two-parent family. The age of the head of household ranges between 22 and 77 with a mean of 40. The household head has an average of 12.9 years of schooling with a range of 1 to 17 years. The age of the spouse ranges between 23 and 73 with a mean of 38.1. The wife has an average of 13.1 years of schooling with a range of 2 to 17 years. The majority of the head of household are Caucasian (n=1090, 72.7%), followed by African American (n=174, 11.6%), Hispanic (n=164, 10.9%), Asian (n=53, 3.6%), Native American (n=9, 0.6%), and other (n=9, 0.6%).

The individuals who completed the questionnaires are considered to be the primary caregivers. The majority of the primary caregivers for the children in the current study are mothers (stepmother/adoptive mother, n=1459, 97.4%), followed by fathers (stepfather/adoptive father, n=23, 1.5%), legal guardians (n=16, 1.1%), and another adult in the household (n=1, 0.1%).

Table 3: Parent Demographics (N=1,499)

	Total Mean (SD)	Range	Chronic Mean (SD)	Nonchronic Mean (SD)
Age of head	40 (8.0)	22-77	40.5 (8.6)	39.6 (7.4)
Age of spouse	38.1(6.9)	23-73	38.4 (7.3)	37.9 (6.5)
Education				
Head of household	12.9 (3.2)	1-17	13.0 (3.2)	12.8 (3.2)
Spouse	13.1 (2.9)	2-17	13.1 (3.0)	13.0 (2.8)
	N (%)		N (%)	N(%)
Sex of head of household				
Male	1430 (95.4%)		664 (95.8%)	766 (95.0%)
Female	69 (4.6%)		29 (4.2%)	39 (4.8%)
Family structure				
Two parent	1410 (94.0%)		650 (93.8%)	759 (94.2%)
Other	89 (6.0%)		43 (6.2%)	47 (5.8%)
Race of head of household				
Caucasian	1090(72.7%)		511 (73.7%)	579 (71.8%)
African American	174 (11.6%)		88 (12.7%)	86 (10.7%)
Hispanic	164 (10.9%)		68 (9.8%)	96 (11.9%)
Asian	53 (3.6%)		16 (2.3%)	38 (4.7%)
Native American	9 (0.6%)		5 (0.7%)	5 (0.6%)
Other	9 (0.6%)		6 (0.9%)	3 (0.4%)
Child's responding parent				
Mother	1459 (97.4%)		677 (97.7%)	782 (97.0%)
Father	23 (1.5%)		7 (1.0%)	15 (1.9%)
Legal guardian	16 (1.1%)		8 (1.2%)	8 (1.0%)
Other adult in household	1 (0.1%)		1 (0.1%)	--

Note: Mother includes stepmother and adoptive mother. Father includes stepfather and adoptive father.

The demographic characteristics of the household are presented in Table 4. The number of individuals in the family unit ranges from 2 to 12 (mean 4.6), and the number of children younger than 18 in the household ranges between one and nine (mean 2.44). The majority of families were above the poverty line (n=1367, 91.2%) with an average total family income of $60,817.80 (range 0 to 1,512,000). The average total family income may be high because of the inclusion of the family income of 1.512 million. Therefore, examining the median household income is necessary. The median income for the sample is 46,700. In 2000, the median national household income was 41,994 (U.S. Census Bureau, 2000). Thus, the median for the sample is a clearer picture of household income than the average.

T-tests and chi square tests were used to assess demographic differences between children living with a chronic illness and children not living with a chronic illness. There were no significant differences between the demographic profiles of the children in the chronic and nonchronic groups based on the child's age; sex, race and education of the household head; the age and education of the wife; the participant's relationship to the child; the household type (dual parent or other); the number of people in the family unit; the family income; and whether the family is at or below the poverty level. However, differences were found between the groups for the sex of the child (more female nonchronic, male chronic; X^2 (1) = 17.9, p <.001), the race of the child (more Caucasian, Hispanic, and Asian nonchronic; more African American chronic; X^2 (5) = 13.4, p < .02) the number of children in the household

(more children in the nonchronic group; $t(1486.98) = 3.02$, $p < .002$), and the age of the household head (older in chronic group; $t(1497) = -2.31$, $p < .02$).

Table 4: Household demographics (N=1,499)

	Total Mean (SD)	Range	Chronic Mean (SD)	Nonchronic Mean (SD)
Number of people in family unit	4.6 (1.3)	2-12	4.5 (1.3)	4.6 (1.2)
Number of children under 18	2.4 (1.2)	1-9	2.4 (1.1)	2.5 (1.2)
Total family income($)	60,818 (74,650)	0-1.512M	62,266 (52,772)	59,573 (89,294)
	N (%)		N (%)	N(%)
At or below poverty level				
No	1367 (91.2%)		635 (91.6%)	733 (90.9%)
Yes	132 (8.8%)		58 (8.4%)	73 (9.5%)

Measures.

Table 5 provides the means, standard deviations, and range of scores for each of the measures used in the current study for the sample total, chronic, nonchronic, low social support, and mid to high social support groups. T-tests were run for each of the groups, chronic/nonchronic and low/mid-high social support. Children living with a chronic illness experience significantly more child health stress ($t(1246.68) = -4.34$, $p < .001$), more parental cognitive stimulation ($t(1492.59) = -2.06$, $p < .04$), more parental warmth ($t(1490) = -2.41$, $p < .02$), and more child behavior problems ($t(1320.81) = -3.58$, $p < .001$) than children not living with a chronic illness. However, primary caregivers of children not living with a chronic illness experience significantly greater levels of psychological distress ($t(1422.37) = 1.93$, $p < .05$) than caregivers of children living with a chronic illness. Mid to high levels of social support were also found to be significantly related to higher levels of economic strain ($t(1181.17) = -4.74$, $p < .01$), child health stress ($t(1131.71) = -2.79$, $p < .01$), parental cognitive stimulation ($t(1391) = -7.89$, $p < .01$), parental emotional support ($t(1391) = -1.99$, $p < .05$), and parental warmth ($t(1328.13) = -3.15$, $p < .01$) than low levels of social support.

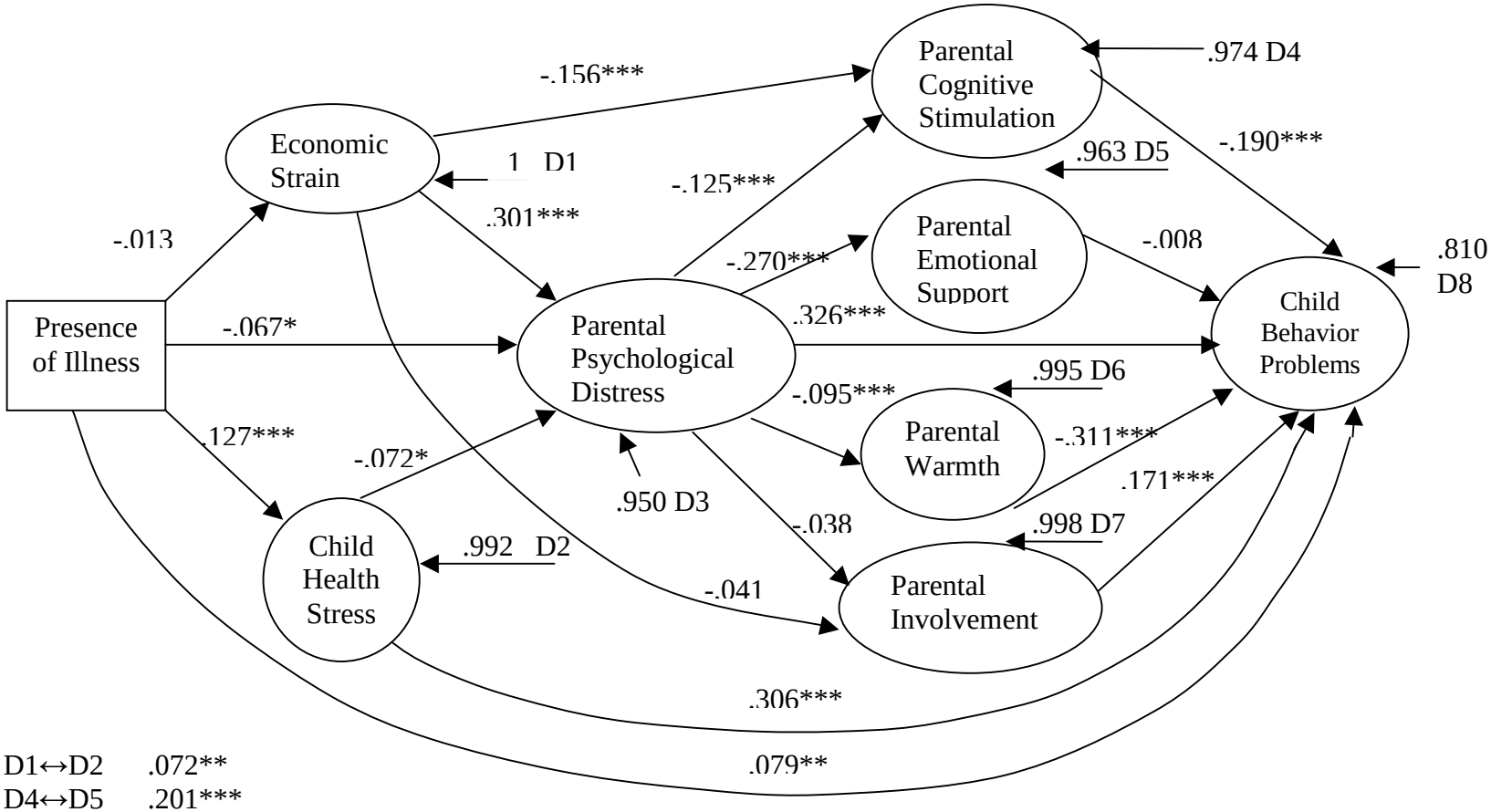
Table 5: Measure Demographics

Measure	Total Mean	Total SD	R	C Mean	NC Mean	t-test	LSS Mean	HSS Mean	t-test	C SD	NC SD	LSS SD	HSS SD
Economic strain	1.60	1.92	0-11	1.56	1.64		1.36	1.87	***	1.88	1.95	1.71	2.09
Child health stress	0.10	0.42	0-3	0.15	0.06	***	0.07	0.14	**	0.48	0.35	0.33	0.51
Parental psychological distress	16.26	5.80	10-45	15.94	16.53	*	16.15	16.44		5.37	6.14	6.10	5.60
Parental cognitive stimulation	10.23	1.84	4-14	10.33	10.14		9.87	10.64	***	1.74	1.91	1.85	1.79
Parental emotional support	9.15	1.19	2-11	9.18	9.12		9.13	9.26	*	1.09	1.28	1.18	1.19
Parental warmth	26.10	3.32	9-30	26.32	25.91	*	25.86	26.42	***	3.19	3.41	3.72	2.83
Parental involvement	34.14	7.58	15-60	34.36	33.96		33.90	34.45		7.70	7.47	7.16	8.02
Child behavior problems	39.98	8.24	30-75	40.82	39.26	***	39.64	40.16		8.99	7.46	7.99	8.42

Note: C = Children living with a chronic illness. NC = Children not living with a chronic illness. LSS = Low levels of social support. HSS = Mid to high levels of social support. M = Mean. SD = Standard deviation. R = Range.
t-test = *p<.05. **p<.01. ***p<.001.

Structural equation model for the total sample

The fit of the model was good (model χ^2 = 58.185, df=11, CFI = 0.964; SRMR = 0.027; RMSEA = 0.054, RMSEA confidence interval 0.040 to 0.067) suggesting that analysis of individual paths is acceptable. Figure 5 provides a pictorial representation of the individual direct paths. Direct, indirect, and total effects of the relationship between variables can be seen in Table 6.



D1↔D2 .072**
D4↔D5 .201***
D4↔D6 1.626***
D4↔D7 4.604***
D5↔D6 -.155
D5↔D7 .602**
D6↔D7 12.283***

Figure 5: Total Sample SEM Standardized Solution

Note: *p<.05. **p<.01. ***p<.001.

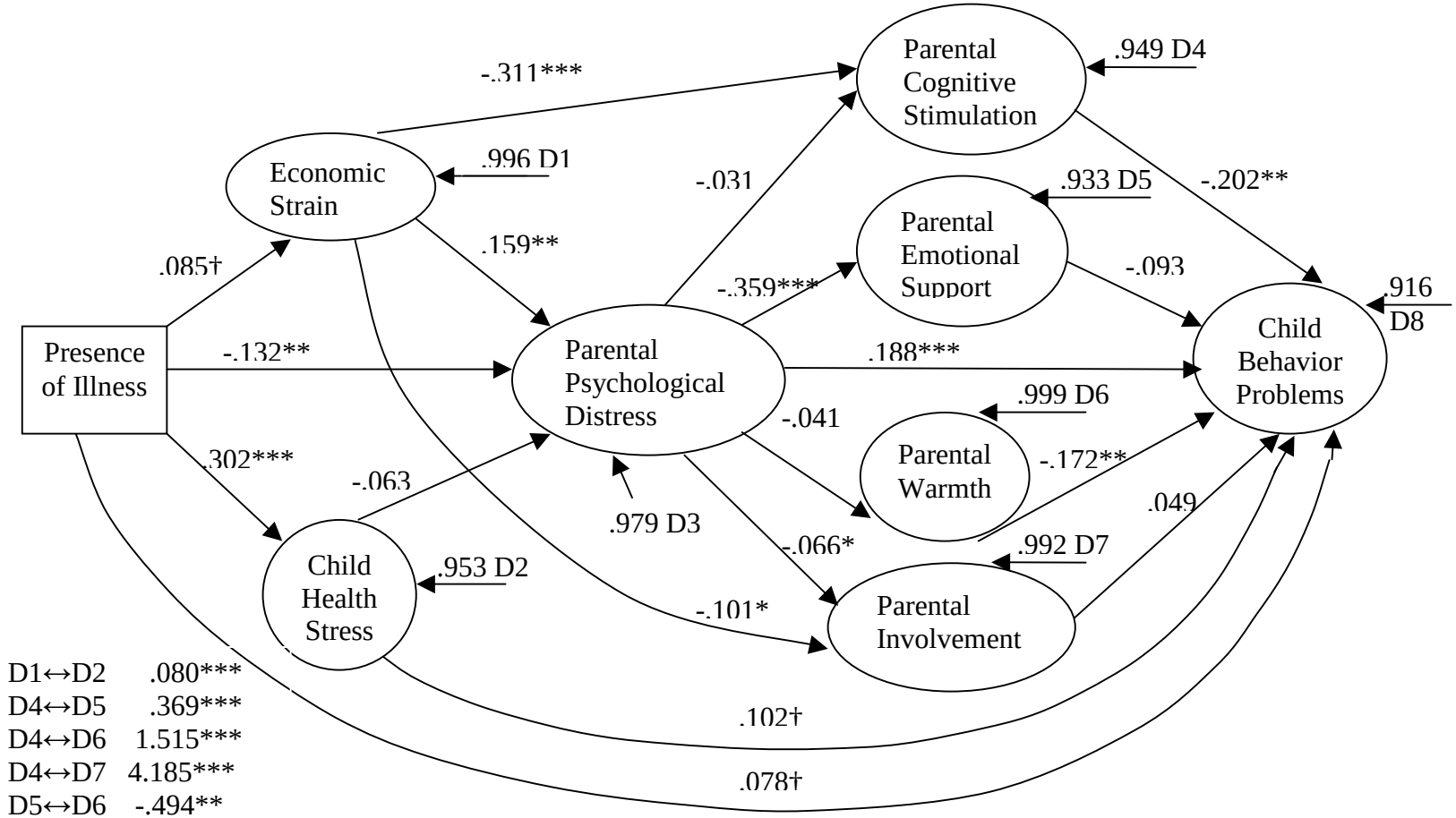
Table 6: Standardized Direct, Indirect and Total Effects for Total Sample

Predictor	Dependent Variable	Direct Effect	Indirect Effect	Total Effect
Illness presence				
	Economic strain	-.013	--	-.013
	Child health stress	.127***	--	.127
	Psychological distress	-.067*	-.013	-.080
	Cognitive stimulation	--	.012†	.012
	Emotional support	--	.022**	.022
	Warmth	--	.008*	.008
	Involvement	--	.004	.004
	Child behavior problems	.079**	.009	.088
Economic strain				
	Psychological distress	.301***	--	.301
	Cognitive stimulation	-.156***	-.037***	-.193
	Emotional support	--	-.081***	-.081
	Warmth	--	-.029**	-.029
	Involvement	-.041	-.011	-.053
	Child behavior problems	--	.135***	.135
Child health stress				
	Psychological distress	-.072*	--	-.072
	Cognitive stimulation	--	.009†	.009
	Emotional support	--	.019*	.019
	Warmth	--	.007†	.007
	Involvement	--	.003	.003
	Child behavior problems	.306***	-.027*	.279
Parental psychological distress				
	Cognitive stimulation	-.125***	--	-.125
	Emotional support	-.270***	--	-.270
	Warmth	-.095***	--	-.095
	Involvement	-.038	--	-.038
	Child behavior problems	.326***	.049**	.375
Parental cognitive stimulation				
	Child behavior problems	-.190***	--	-.190
Parental emotional support				
	Child behavior problems	-.008	--	-.008
Parental warmth				
	Child behavior problems	-.311***	--	-.311
Parental involvement				
	Child behavior problems	.171***	--	.171

Note: †p<.10. *p<.05. **p<.01. ***p<.001.

Multigroup structural equation model

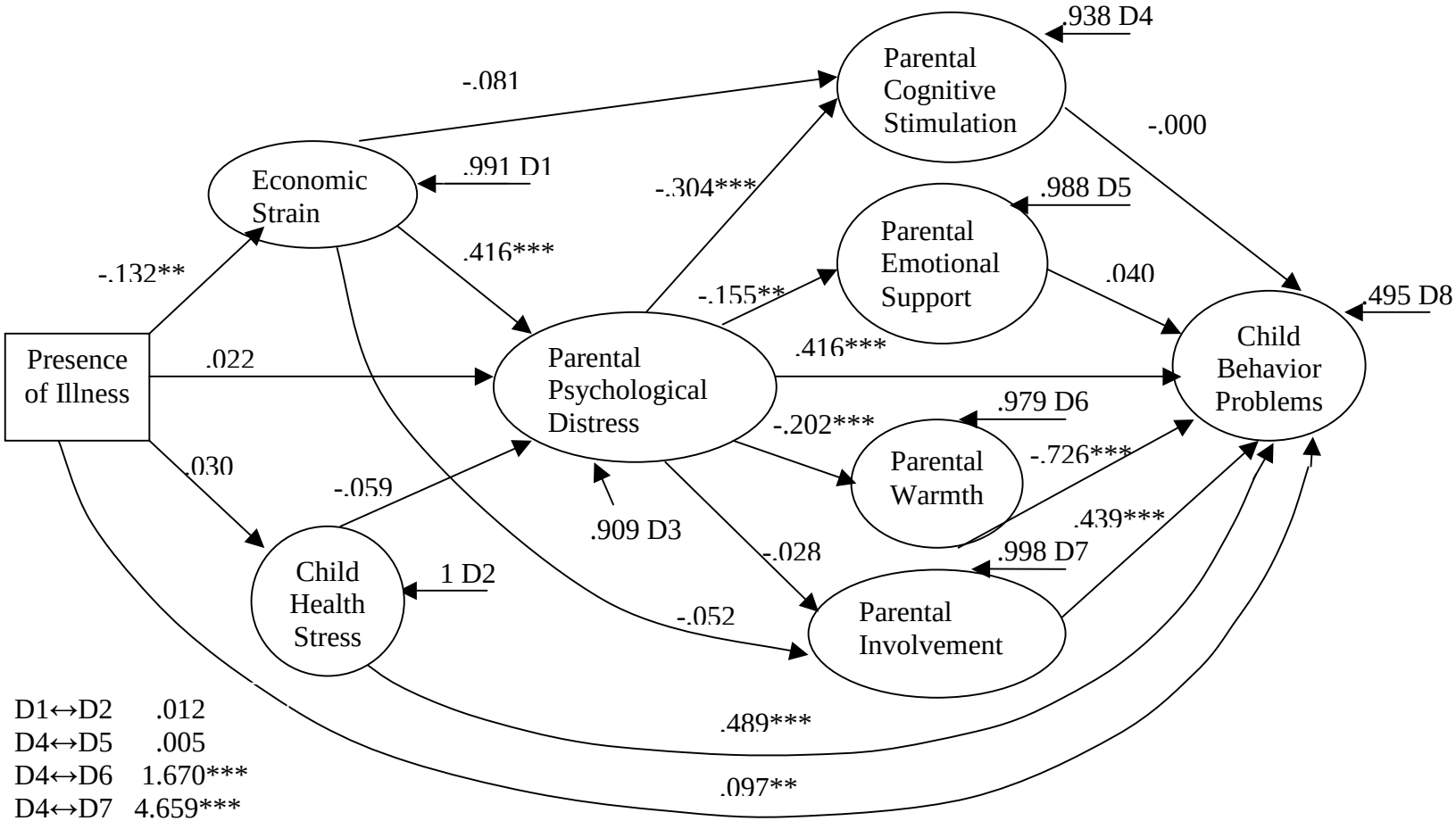
The fit for the low levels of social support model (model χ^2 = 52.916, df = 11, CFI = 0.927; SRMR = 0.033; RMSEA = 0.073, RMSEA confidence interval 0.054 to 0.093) and the mid to high levels of social support model (model χ^2 = 68.449, df = 11, CFI = 0.942; SRMR = 0.046; RMSEA = 0.088, RMSEA confidence interval 0.068 to 0.108) did not meet the joint criteria for good model fit; CFI $\geq$ 0.96 and SRMR $\leq$ 0.10 or RMSEA $\leq$ 0.06 and SRMR $\leq$ 0.10 (Hu & Bentler, 1999). However, when the two models were run simultaneously, without constraints, a multisample adjustment was conducted in the fit indices by EQS. After the adjustment the fit is good using joint criteria (model χ^2 = 121.364, df = 22, CFI = 0.937; SRMR = 0.040; RMSEA = 0.057, RMSEA confidence interval 0.047 to 0.067). Figures 6 and 7 provide pictorial representations of the individual direct paths for the low and mid to high social support models. Standardized direct, indirect, and total effects of the relationship between variables can be seen in Table 7. The figures and tables show standardized solutions, but the unstandardized solutions are the paths that are compared. Standardized solutions are provided for interpretability.



D1↔D2 .080***
D4↔D5 .369***
D4↔D6 1.515***
D4↔D7 4.185***
D5↔D6 -.494**
D5↔D7 .177
D6↔D7 12.616***

Figure 6: Low Levels of Social Support SEM Standardized Solution

Note: †p<.10. *p<.05. **p<.01. ***p<.001.



D1↔D2	.012
D4↔D5	.005
D4↔D6	1.670***
D4↔D7	4.659***
D5↔D6	.106
D5↔D7	.992**
D6↔D7	12.330***

Figure 7: Mid to High Levels of Social Support SEM Standardized Solution

Note: *p<.05. **p<.01. ***p<.001.

Table 7: Standardized Direct, Indirect, and Total Effects for Levels of Social Support

		Low social support			Mid-high social support		
Predictor	Dependent var.	Direct Effect	Indirect Effect	Total Effect	Direct Effect	Indirect Effect	Total Effect
Presence of illness							
	Economic strain	.085†	--	.085	-.132**	--	-.132
	Child health stress	.302***	--	.302	.030	--	.030
	Psychological distress	-.132**	-.006	-.137	.022	-.057**	-.034
	Cognitive stimulation	--	-.022	-.022	--	.021	.021
	Emotional support	--	.049**	.049	--	.005	.005
	Warmth	--	.006	.006	--	.007	.007
	Involvement	--	.001	.001	--	.008	.008
	Child behavior prob.	.078†	.004	.082	.097**	-.001	.096
Economic strain							
	Psychological distress	.159**	--	.159	.416***	--	.416
	Cognitive stimulation	-.311***	-.005	-.316	-.081	-.127***	-.208
	Emotional support	--	-.057**	-.057	--	-.065**	-.065
	Warmth	--	-.006	-.006	--	-.084***	-.084
	Involvement	-.101*	-.011	-.112	-.052	-.012	-.064
	Child behavior prob.	--	.095***	.095	--	.204***	.204
Child health stress							
	Psychological distress	-.063	--	-.063	-.059	--	-.059
	Cognitive stimulation	--	.002	.002	--	.018	.018
	Emotional support	--	.023	.023	--	.009	.009
	Warmth	--	.003	.003	--	.012	.012
	Involvement	--	.004	.004	--	.002	.002
	Child behavior prob.	.102†	-.015	.087	.489***	-.032	.456
Psychological distress							
	Cognitive stimulation	-.031	--	-.031	-.304***	--	-.304
	Emotional support	-.359***	--	-.359	-.155**	--	-.155
	Warmth	-.041	--	-.041	-.202***	--	-.202
	Involvement	-.066*	--	-.066	-.028	--	-.028
	Child behavior prob.	.188***	.043†	.232	.416***	.128***	.544
Cognitive stimulation							
	Child behavior prob.	-.202**	--	-.202	-.000	--	-.000
Emotional support							
	Child behavior prob.	-.093	--	-.093	.040	--	.040
Warmth							
	Child behavior prob.	-.172**	--	-.172	-.726***	--	-.726
Involvement							
	Child behavior prob.	.049	--	.049	.439***	--	.439

Note: †p<.10. *p<.05. **p<.01. ***p<.001.

Hypothesis thirteen.

Hypothesis 13 was analyzed using multigroup structural equation modeling. Hypothesis 13 states that mid to high levels of social support moderate all of the relations in the model. In order to more clearly assess this hypothesis each of the relationships between variables is examined after each of the corresponding hypotheses. Each of the paths was individually constrained to be the same across groups, if the groups differed significantly; the constraint was released allowing the group's paths to vary. If the constraint was not statistically significant, the group's paths are considered equal, indicating no difference between groups. To assess constraint significance, the difference between the model chi-square and degrees of freedom for the constrained and unconstrained models were examined. The difference between the model chi-squares and significance are included for each relationship below. Figure 8 provides a pictorial representation of the structural equation model both with and without constraints. Both unstandardized and standardized path coefficients are included.

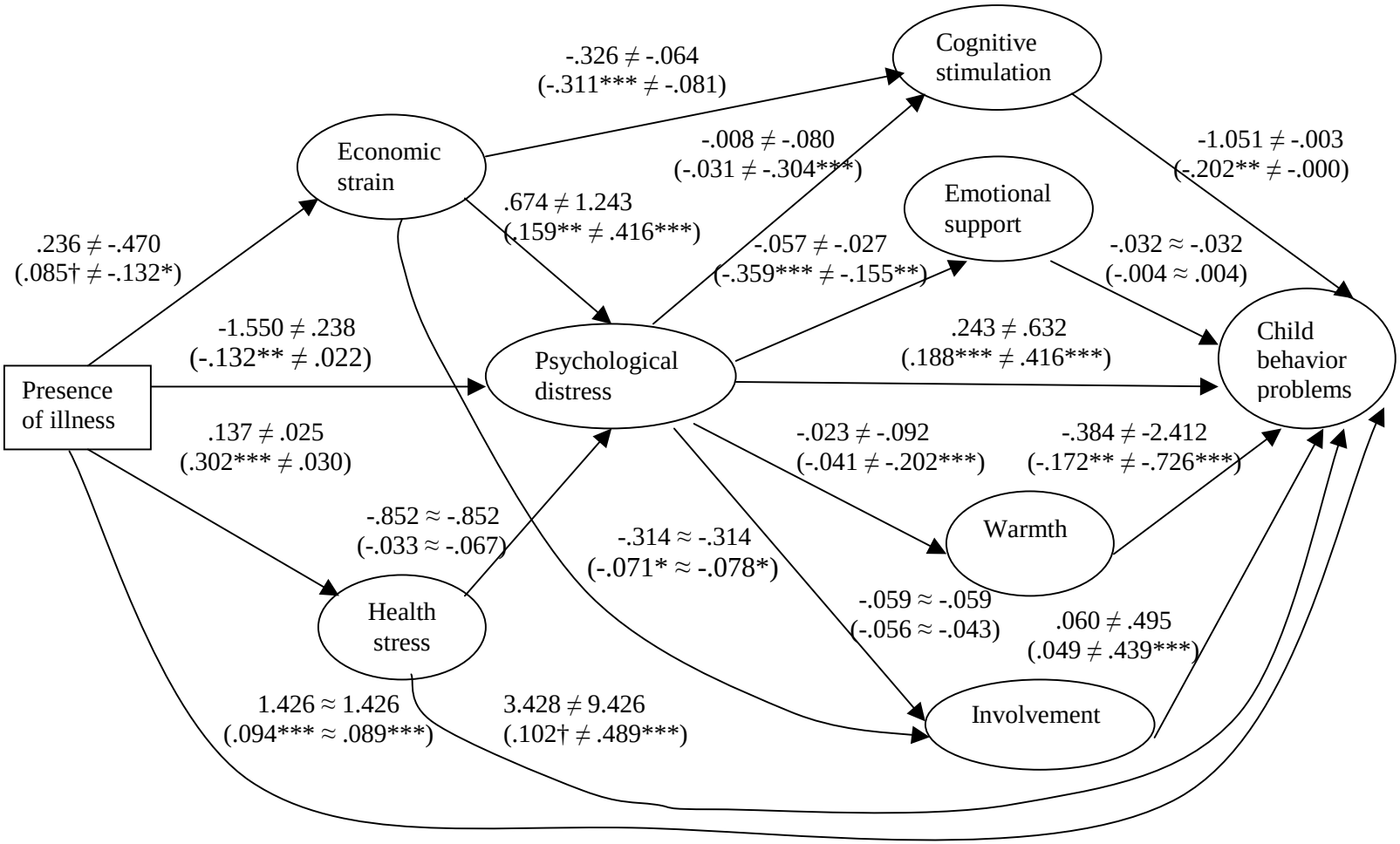


Figure 8: SEM Low and Mid to High Levels of Social Support with Constraints Applied

Note: Top numbers unstandardized coefficients, low/high social support. Bottom numbers standardized coefficients, low/high social support. ≠ = statistically significant (.05 or smaller) difference between group path coefficients. ≈ = no statistically significant difference between group path coefficients. †p<.10. *p<.05. **p<.01. ***p<.001.

Hypothesis one.

The first hypothesis predicted that the presence of a chronic illness positively influences economic strain. The path from the presence of chronic illness to economic strain was negative and not significant ($\beta = -.013$, $p > .05$). This indicates that there is not support for a relationship between the presence of a chronic illness and economic strain. Thus, hypothesis one was not supported.

Hypothesis one social support moderation.

The Lagrange Multiplier Test for Constraints revealed that the constraint for the path coefficient between presence of illness and economic strain does not hold for the low and mid to high levels of social support groups ($\chi^2 = 11.827$, $p < .001$). The unstandardized paths are .236 (standardized .085, $p < .10$) for low levels of social support and -.470 (standardized -.132, $p < .001$) for high levels of social support. These coefficients indicate that under conditions of low levels of social support, illness presence is marginally positively related to economic strain. In contrast, under conditions of mid to high levels of social support, the presence of a chronic illness is associated with decreased economic strain. This suggests that higher levels of social support act as a buffer against possible effects of illness presence on economic strain.

Hypothesis two.

Hypothesis two states that the presence of a chronic illness positively influences child health stress. The path from the presence of chronic illness to child health stress was positive and statistically significant ($\beta = .127$, $p < .001$). As

expected children living with a chronic illness are more likely to have health stress than children not living with an illness. Hypothesis two was supported.

Hypothesis two social support moderation.

The constraint for the relationship between the presence of chronic illness and child health stress does not hold for the low and mid to high levels of social support groups ($\chi^2 = 5.753$, $p < .02$). The unstandardized paths are .137 (standardized .302, $p < .001$) for low levels of social support and .025 (standardized .030, $p > .05$) for high levels of social support. These coefficients indicate that mid to high levels of social support moderate or buffer the relationship between the presence of chronic illness and child health stress.

Hypothesis three.

The third hypothesis asserts that the presence of a chronic illness has a direct and positive effect on parental psychological distress. The path between illness presence and parental psychological distress is negative and statistically significant ($\beta = -.067$, $p < .05$). This indicates that the presence of a chronic illness significantly decreases parental psychological distress. These findings do not support the third hypothesis.

Hypothesis three social support moderation.

The constraints were not tenable for the relationship between the presence of illness and parental psychological distress ($\chi^2 = 7.424$, $p < .01$). Once the constraints were released the unstandardized paths were -1.550 (standardized -.132, $p < .01$) for low levels of social support and .238 (standardized .022, $p > .05$) for high levels of

social support. Under conditions of low levels of social support the presence of a chronic illness significantly decreases parental psychological distress. There is no relationship between illness presence and psychological distress when there are mid to high levels of support. Therefore there is no buffering effect of social support in this relationship. Instead there appears to be reverse buffering, under conditions of lower levels of social support there is an association with a decrease in parental psychological distress when a chronic illness is present.

Hypothesis four.

The fourth hypothesis states that the presence of a chronic illness has a direct and positive effect on child behavior problems. Chronic illness has a positive and significant relationship with child behavior problems ($\beta = .079$, $p < .01$). Hypothesis four is supported.

Hypothesis four social support moderation.

The path coefficients between the presence of chronic illness and child behavior problems are constrained for both groups ($\chi^2 = .219$, $p > .05$). The unstandardized paths for both low and mid to high levels of social support is 1.426, $p < .001$ (standardized .094 for low and .089 for mid to high levels of social support). Social support does not moderate the relationship between the presence of a chronic illness and child behavior problems.

Hypothesis five.

Hypothesis five predicts that higher levels of economic strain increase parental psychological distress. The path between economic strain and parental

psychological distress is positive and statistically significant ($\beta = .301$, $p < .001$). Thus, the fifth hypothesis is supported.

Hypothesis five social support moderation.

The constraint for the relationship between economic strain and parental psychological distress was not tenable for both groups ($\chi^2 = 4.681$, $p < .05$). The unstandardized paths are .674 (standardized .159 , $p < .01$) for low levels of social support and 1.243 (standardized .416, $p < .001$) for high levels of social support. These coefficients indicate that social support does not buffer the relationship between economic strain and parental psychological distress. Instead there appears to be reverse buffering, and lower levels of social support are associated with a smaller increase in parental psychological distress when economic strain is present.

Hypothesis six.

The sixth hypothesis states that higher levels of child health stress increase parental psychological distress. Child health stress does have a significant, but negative influence on parental psychological distress ($\beta = -.072$, $p < .05$). The direction of this relationship is contrary to the hypothesis, thus the sixth hypothesis is not supported.

Hypothesis six social support moderation.

The path coefficients between child health stress and parental psychological distress are constrained for both groups ($\chi^2 = .24$, $p > .05$). The unstandardized paths for both low and mid to high levels of social support is -.852 (standardized -.033 for low and -.067 for mid to high levels of social support). There is no moderation of

social support for the relationship between child health stress and parental psychological distress.

Hypothesis seven.

Hypothesis seven asserts that economic strain leads to a decrease in parental cognitive stimulation. The data indicates that economic strain has a significant negative effect on parental cognitive stimulation ($\beta = -.156$, $p < .001$). The seventh hypothesis is supported.

Hypothesis seven social support moderation.

The constraint for the relationship between economic strain and parental cognitive stimulation was not tenable for both groups ($\chi^2 = 11.881$, $p < .001$). The unstandardized paths are -.326 (standardized -.311, $p < .001$) for low levels of social support and -.064 (standardized -.081, $p > .05$) for high levels of social support. Economic strain more negatively influences parental cognitive stimulation under conditions of lower levels of social support. Under conditions of mid to high levels of support the relationship between economic strain and cognitive stimulation disappears. This indicates that social support acts as a buffer between these two variables.

Hypothesis eight.

The eighth hypothesis states that economic strain leads to a decrease in parental involvement. Economic strain is negatively associated with parental involvement, but not significantly ($\beta = -.041$, $p > .05$). Therefore, the eighth hypothesis is not supported.

Hypothesis eight social support moderation.

The path coefficients between economic strain and parental involvement are constrained for both groups ($\chi^2 = .702$, $p > .05$). The unstandardized paths for both low and mid to high levels of social support is -.314, $p < .05$ (standardized -.071 for low and -.078 for mid to high levels of social support). There is no moderation of social support for the relationship between economic strain and parental involvement.

Hypothesis nine.

Hypothesis nine maintains that higher levels of child health stress lead to an increase in child behavior problems. Child health stress positively and significantly increases child behavior problems ($\beta = .306$, $p < .001$). The ninth hypothesis is supported.

Hypothesis nine social support moderation.

The constraints for the relationship between child health stress and child behavior problems were not tenable for both groups ($\chi^2 = 6.823$, $p < .01$). The unstandardized paths are 3.428 (standardized .102, $p < .10$) for low levels of social support and 9.426 (standardized .489, $p < .001$) for high levels of social support. Social support does not act as a buffer for the relationship between child health stress and child behavior problems. Instead there appears to be reverse buffering, where child health stress, under conditions of lower levels of social support, is associated with fewer child behavior problems than when higher levels of social support are present.

Hypothesis ten.

The tenth hypothesis states that higher levels of parental psychological distress negatively influence all parenting behaviors; parental cognitive stimulation, parental emotional support, parental warmth, and parental involvement. Parental psychological distress was negatively and significantly related to parental cognitive simulation ($\beta = -.125$, $p < .001$), emotional support ($\beta = -.270$, $p < .001$), and warmth ($\beta = -.095$, $p < .001$). Parental involvement is negatively associated with parental psychological distress in this sample, but not significantly ($\beta = -.038$, $p > .05$). Hypothesis ten is partially supported.

Hypothesis ten social support moderation.

Parental psychological distress and parental cognitive stimulation.

The constraints were not tenable for the relationship between parental psychological distress and parental cognitive stimulation ($\chi^2 = 13.781$, $p < .001$). The unstandardized paths are -.008 (standardized -.301, $p > .05$) for low levels of social support and -.080 (standardized -.304, $p < .001$) for high levels of social support. Social support does not buffer the relationship of parental psychological distress and parental cognitive stimulation. Instead there appears to be reverse buffering. Under conditions of low levels of social support there is no relationship between parental psychological distress and parental cognitive stimulation, conversely under conditions of mid to high levels of support parental psychological distress significantly decreases parental cognitive stimulation.

Parental psychological distress and parental emotional support.

The constraints for the relationship between parental psychological distress and parental emotional support were not tenable for both groups ($\chi^2 = 6.306$, $p < .02$). The unstandardized paths are -.057 (standardized -.359, $p < .001$) for low levels of social support and -.027 (standardized -.155, $p < .01$) for high levels of social support. Under conditions of mid to high levels of social support the magnitude of the relationship between parental psychological distress and parental emotional support is smaller than under conditions of low levels of social support. This suggests a reverse buffering effect.

Parental psychological distress and parental warmth.

The constraints for parental psychological distress and parental warmth were released ($\chi^2 = 4.411$, $p < .05$). The unstandardized paths are -.023 (standardized -.041) for low levels of social support and -.092 (standardized -.202, $p < .001$) for high levels of social support. Higher levels of social support do not buffer the influence of parental psychological distress on parental warmth. Instead there appears to be reverse buffering. Under conditions of low levels of social support there is no relationship between parental psychological distress and parental warmth, whereas under conditions of mid to high levels of support there is parental psychological distress significantly decreases parental warmth.

Parental psychological distress and parental involvement.

The path coefficients between parental psychological distress and parental involvement are constrained for both groups ($\chi^2 = .149$, $p > .05$). The unstandardized

paths for both low and mid to high levels of social support is -.059 (standardized -.056 for low and -.043 for mid to high levels of social support). Social support does not buffer the relationship between parental psychological distress and parental involvement.

Hypothesis eleven.

Hypothesis eleven asserts that higher levels of parental psychological distress increase child behavior problems. The direct path between parental psychological distress and child behavior problems is positive and significant ($\beta = .326$, $p < .001$), indicating that as a parent's psychological distress increases so does the child's behavior problems. Thus hypothesis eleven is supported.

Hypothesis eleven social support moderation.

The EQS program could not estimate the relationship between parental psychological distress and child behavior problems in a constrained model; therefore the constrained chi-square was calculated manually[2]. The levels of social support differed statistically significantly for the relationship between parental psychological distress and child behavior problems ($\chi^2 = 20.313$, $p < .001$). The unstandardized paths are .243 (standardized .188, $p < .001$) for low levels of social support and .632 (standardized .416, $p < .001$) for high levels of social support. Social support does not buffer the relationship between parental psychological distress and child behavior problems. Instead there appears to be reverse buffering. Under conditions

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[2] $SE(P_1 - P_2) = \sqrt{[SE(P_1)]^2 + [SE(P_2)]^2}$ $z = P_1 - P_2 / SE(P_1 - P_2)$ $z^2 = \chi^2_{df1}$
SE = Standard error. P_1 = Low social support unconstrained path. P_2 = Mid to high unconstrained path.

of low levels of social support the magnitude of the path coefficient is smaller from parental psychological distress to child behavior problems than when under conditions of mid to high levels of social support.

Hypothesis twelve.

The twelfth hypothesis states that higher levels of parental cognitive stimulation, emotional support, warmth, and involvement lead to a decrease in child behavior problems. Parental cognitive stimulation ($\beta = -.190$, $p < .001$) and warmth ($\beta = -.311$, $p < .001$) are associated with a decrease in child behavior problems. Emotional support does have a negative relationship with child behavior problems, but not a significant one ($\beta = -.008$, $p > .05$). Unexpectedly, parental involvement is significantly associated with increased child behavior problems ($\beta = .171$, $p < .001$). Therefore, the twelfth hypothesis is only partially supported.

Hypothesis twelve social support moderation.

Parental cognitive stimulation and child behavior problems.

The constraints for the relationship between parental cognitive stimulation and child behavior problems were not tenable for both groups ($\chi^2 = 4.298$, $p < .05$). The unstandardized paths are -1.051 (standardized -.202, $p < .01$) for low levels of social support and -.003 (standardized -.000, $p > .05$) for high levels of social support. Under conditions of low levels of social support, behavior problems are significantly decreased by the presence of parental cognitive stimulation. Contrary to expectation, higher levels of social support do not enhance this relationship between parental cognitive stimulation and child behavior problems.

Parental emotional support and child behavior problems.

The path coefficients between parental emotional support and child behavior problems are constrained for both groups ($\chi^2 = 2.929$, $p < .10$). The unstandardized paths for both low and mid to high levels of social support is -.032 (standardized -.004, $p > .05$). There is no moderation of social support for the relationship between the parental emotional support and child behavior problems.

Parental warmth and child behavior problems.

The constraints were released for the relationship between parental warmth and child behavior problems ($\chi^2 = 54.612$, $p < .001$). The unstandardized paths are -.384 (standardized -.172, $p < .01$) for low levels of social support and -2.412 (standardized -.726, $p < .001$) for high levels of social support. Parental warmth has a negative relationship with child behavior problems for both low and mid to high levels of social support. However under conditions of mid to high levels of social support, the magnitude of the relationship between parental warmth has a more negative influence on child behavior problems than under conditions of low levels of social support. Therefore mid to high levels of social support buffer the relationship between parental warmth and child behavior problems.

Parental involvement and child behavior problems.

The path coefficient between parental involvement and child behavior problems varies based on individual levels of support ($\chi^2 = 12.139$, $p < .001$). The unstandardized paths are .060 (standardized .049, $p > .05$) for low levels of social support and .495 (standardized .439, $p < .001$) for high levels of social support.

Contrary to expectation, parental involvement has a statistically significant, positive relationship with child behavior problems under conditions of mid to high levels of social support. This relationship indicates that higher levels of social support do not buffer the relationship between parental involvement and child behavior problems. Instead there appears to be reverse buffering. Under conditions of low levels of social support parental involvement does not influence child behavior problems, but under conditions of mid to high levels of social support parental involvement is significantly associated with increased child behavior problems.

Summary of hypothesis thirteen.

There are five paths that mid to high levels of social support buffer or moderate the relationship: presence of illness and economic strain, presence of illness and child health stress, economic strain and parental cognitive stimulation, parental psychological distress and parental emotional support, and parental warmth and child behavior problems. There are four paths that are the same across the social support groups: presence of illness and child behavior problems, child health stress and parental psychological distress, economic strain and parental involvement, and parental emotional support and child behavior problems. Contrary to expectations eight paths have a reverse buffer with lower levels of social support having more favorable path coefficients than mid to high levels of support. These paths include: presence of illness and parental psychological distress, economic strain and parental psychological distress, child health stress and child behavior problems, parental psychological distress and parental cognitive stimulation, parental psychological

distress and parental warmth, parental psychological distress and child behavior problems, parental cognitive stimulation and child behavior problems, and parental involvement and child behavior problems.

Indirect effects of the presence of illness

The indirect effects of the presence of illness on child behavior problems were examined for the entire model. The total indirect effect of illness on behavior problems is $\beta = .009$. However, the indirect sequence from the presence of illness to child health stress to child behavior problems yields a coefficient of $\beta = .03886$. The magnitude coefficient is lost when the remaining indirect sequences, which are mainly negative, are summed to create the overall indirect effect of the presence of illness on child behavior problems. Table 8 provides the indirect sequences from the presence of illness to child behavior problems through economic strain and child health stress.

Table 8: Indirect Effects of the Presence of Illness on Child Behavior Problems

Through economic strain and:	
Parental psychological distress (but not parenting)	
Economic strain → Parental psychological distress → Behavior problems	-.00127
Parental psych distress and parenting (Conger/Elder model)	
Economic strain → Parental cognitive stimulation → Behavior	-.00039
Economic strain → Parental involvement → Behavior	-.00009
Economic strain → Parental psychological distress → Parental cognitive stimulation → Behavior	-.00009
Economic strain → Parental psychological distress → Parental emotional support → Behavior	-.00000
Economic strain → Parental psychological distress → Parental warmth → Behavior	-.00012
Economic strain → Parental psychological distress → Parental involvement → Behavior	.00003
Through child health stress and:	
Direct	
Child health stress → behavior problems	.03886
Parental psychological distress (but not parenting)	
Child health stress → Parental psychological distress → Behavior problems	-.00298
Parental psychological distress and parenting (Conger/Elder model) .	
Child health stress → Parental psychological distress → Parental cognitive stimulation → Behavior	-.00022
Child health stress → Parental psychological distress → Parental emotional support → Behavior	-.00002
Child health stress → Parental psychological distress → Parental warmth → Behavior	-.00270
Child health stress → Parental psychological distress → Parental involvement → Behavior	.00005

Indirect effects of the presence of illness and social support

The indirect effects of the presence of illness on child behavior problems were also examined for low and mid to high levels of social support. The total indirect effect of illness on behavior problems under conditions of low social support is β = .004 and under conditions of mid to high levels of social support is β = -.001. The sequence from the presence of illness through child health stress to child behavior problems is the largest sequence under low levels of social support (β = .03084 for low levels of social support). The sequence from child health stress to behavior problems was β = .01467 for mid to high levels of social support. The largest sequence for mid to high levels of support was through economic strain and parental psychological distress to child behavior problems (β = -.02284). The magnitude of these coefficients were lost when the remaining indirect sequences, which many are negative, are summed to create the overall indirect effect of the presence of illness on child behavior problems. Table 9 and 10 provide the indirect sequences from the presence of illness to child behavior problems through economic strain and child health stress.

Table 9: Indirect Effects of the Presence of Illness on Child Behavior Problems for Low Levels of Social Support

Through economic strain and:	
Parental psychological distress (but not parenting)	
Economic strain → Parental psychological distress → Behavior problems	.00254
Parental psych distress and parenting (Conger/Elder model)	
Economic strain → Parental cognitive stimulation → Behavior	.00534
Economic strain → Parental involvement → Behavior	-.00042
Economic strain → Parental psychological distress → Parental cognitive stimulation → Behavior	.00008
Economic strain → Parental psychological distress → Parental emotional support → Behavior	.00045
Economic strain → Parental psychological distress → Parental warmth → Behavior	.00010
Economic strain → Parental psychological distress → Parental involvement → Behavior	-.00004
Through child health stress and:	
Direct	
Child health stress → behavior problems	.03080
Parental psychological distress (but not parenting)	
Child health stress → Parental psychological distress → Behavior problems	-.00358
Parental psychological distress and parenting (Conger/Elder model) .	
Child health stress → Parental psychological distress → Parental cognitive stimulation → Behavior	-.00012
Child health stress → Parental psychological distress → Parental emotional support → Behavior	-.00064
Child health stress → Parental psychological distress → Parental warmth → Behavior	-.00013
Child health stress → Parental psychological distress → Parental involvement → Behavior	.00006

Table 10: Indirect Effects of the Presence of Illness on Child Behavior Problems for Mid to High Levels of Social Support

Through economic strain and:	
Parental psychological distress (but not parenting)	
Economic strain → Parental psychological distress → Behavior problems	-.02284
Parental psych distress and parenting (Conger/Elder model)	
Economic strain → Parental cognitive stimulation → Behavior	0
Economic strain → Parental involvement → Behavior	.00301
Economic strain → Parental psychological distress → Parental cognitive stimulation → Behavior	0
Economic strain → Parental psychological distress → Parental emotional support → Behavior	.00034
Economic strain → Parental psychological distress → Parental warmth → Behavior	-.00805
Economic strain → Parental psychological distress → Parental involvement → Behavior	-.00067
Through child health stress and:	
Direct	
Child health stress → behavior problems	.01467
Parental psychological distress (but not parenting)	
Child health stress → Parental psychological distress → Behavior problems	-.00074
Parental psychological distress and parenting (Conger/Elder model) .	
Child health stress → Parental psychological distress → Parental cognitive stimulation → Behavior	0
Child health stress → Parental psychological distress → Parental emotional support → Behavior	.00011
Child health stress → Parental psychological distress → Parental warmth → Behavior	-.00026
Child health stress → Parental psychological distress → Parental involvement → Behavior	.00002

Chapter 5: Discussion

The current study examined the relationship between chronic illness in childhood and child behavior problems, including the mediating influences of economic strain, child health stress, parental psychological stress, and parenting behaviors and the moderating influence of social support.

Chronic illness and economic strain

The study's findings suggest that the presence of a chronic illness is not related to economic strain. These results are surprising considering the additional financial costs that are associated with daily illness care (Asmussen, et al., 1999; Barlow, 1997; Kirschstein, 2000; National Chronic Care Consortium, 2003; National Institutes of Health, 1996). However, it is possible that medical insurance covers the additional costs of illness care, such as doctor visits and medications. Children living with a chronic illness had an average of 11.0 months of health insurance coverage and children not living with an illness had 10.7 months of coverage ($t(1493.028) = -1.483$, $p = .143$). These extended periods of health insurance coverage may have relieved some economic strain for families.

Currently, the literature on economic strain and chronic illness is virtually nonexistent. Research has found a relationship between the presence of chronic illness and *poverty* (Egbuonu & Starfield, 1982; Miller, 2000; Vandivere, et al., 2000; Wise, et al., 2002). However, as previously mentioned economic strain is not equated with poverty (McLoyd, 1990). Therefore, it is possible that there is no

significant relationship between the presence of chronic illness in childhood and economic strain.

When the moderation of social support was examined it was found that mid to high levels of social support moderate the relationship between the presence of illness and economic strain. Under conditions of low levels of social support there is a marginal positive relationship between the presence of illness and economic strain, whereas, under mid to high levels of support this relationship is actually negative. This moderation is important because of the positioning of economic strain in the model. Under mid to high levels of social support the link between the presence of illness and increased economic strain is severed, preventing the presence of illness from influencing variables later in the model. It is important to note, however, that for the total sample there is no relationship between the presence of illness and economic strain as positive and negative effects cancel each other out.

Parents that have mid to high levels of social support also reported significantly higher economic strain than parents living with lower levels of social support. Parents may seek out assistance (e.g., health insurance for their child, employment with better benefits) due to the presence of economic strain. If the parent receives the desired support for economic strain, the parent is creating a buffer between the presence of illness and economic strain.

Chronic illness and child health stress

Chronic illness statistically significantly increased child health stress. This result is as expected. Children might be at a greater risk of having health stresses if

their health is somehow compromised by a chronic illness. Previous research has found that children living with a chronic illness may face moderate to severe limitations and bother caused by the illness (Newacheck & Taylor, 1992). Additionally, children living with a chronic illness have a better chance of having their physical activities limited due to illness (Benson, 2001; Newacheck & Halfon, 1998) and having schoolwork and school attendance problems (Msall, et al., 2003; Newacheck, et al., 1998; Schwarz & Lui, 2000) than children without an illness.

Under conditions of mid to high levels of social support, the relationship between the presence of illness and child health stress was buffered. When families are living with low levels of support there is a positive significant relationship between the presence of illness and child health stress; whereas when mid to high levels of support are present there is no relationship between the presence of illness and child health stress. This moderation is important because of the positioning of child health stress in the model. As with economic strain, mid to high levels of social support break the link between the presence of illness and child health stress, preventing the presence of illness from influencing mediating variables later in the model.

Parents who have higher levels of social support reported significantly higher levels of child health stress than people with lower levels of social support. It is possible that because of these stresses parents sought specific assistance with these problem areas. If assistance is sought and received for a particular problem the parents may be creating a buffer for their stress. Or it may be that families living

with an illness are more able or willing to seek help (Cadman, et al., 1991) and when they do get the support they use it to decrease stress.

Chronic illness and parental psychological distress

Contrary to expectations, the presence of a chronic illness did not contribute to parental psychological distress. Instead, illness presence was associated with a significant decrease in parental psychological distress. Some previous research has also found that the presence of illness is not related to an increase in parental psychological distress (Gerhardt, et al., 2003; Marks, 1998). Gerhardt and fellow researchers (2003) examined families living with juvenile rheumatoid arthritis and matched controls to assess parental well-being. Their results indicate no differences between families living with an illness and families not living with an illness (Gerhardt, et al., 2003). Similarly, Marks (1998) examined the effects of caring for disabled children, spouses, parents and other kin on individuals who were middle age, predominately Caucasian, and high school graduates. Marks (1998) found that global assessment of the caregiving role did not harm caregiver well-being. It may be that, although the presence of an illness is stressful, it does not translate into parental psychological distress.

Additionally, it is possible that parents experienced psychological distress after the initial diagnosis of the illness, but adjusted with time. Researchers have noted that mild symptoms of parental psychological distress were found immediately after diagnosis of childhood diabetes (Northam, et al., 1996; Thernlund, et al., 1996). However, these symptoms had typically been resolved at a 12-month follow up

(Northam, et al., 1996). An exception was that individuals who had an intense emotional reaction at the time of the diagnosis did not resolve symptoms as quickly (Thernlund, et al., 1996). The current research may be capturing parents after they have already adjusted to the presence of the chronic illness.

Another possible explanation for the current relationship may have to do with help-seeking behaviors. Parents of children living with a chronic illness may seek therapeutic assistance when they are experiencing psychological distress, whereas parents not living with a child's illness may not (Cadman, et al., 1991). The continued involvement with the medical community that is necessary for parents living with a child with a chronic illness may assist in the help-seeking behavior or may even act as a therapeutic resource. Additionally, some research suggests that families living with a child with a chronic illness have a greater number and broader range of coping responses than other families, which may or may not have been learned while seeking therapeutic assistance (Spence, 1993).

Help-seeking behavior by parents of children living with a chronic illness may expand beyond therapeutic services. Parents may seek out additional social supports to assist them with instrumental tasks and emotional needs. In the current sample, parents of children living with a chronic illness had an average of 3.91 supports whereas parents without a child living with a chronic illness had an average of 3.35 supports ($t(1391) = -3.86$, $p < .001$). These additional supports that parents living with a child with a chronic illness have may assist in decreasing their levels of psychological distress.

The moderation of social support was found to be in the opposite direction expected. Under conditions of mid to high levels of social support there was no relationship between the presence of illness and parental psychological distress, and under conditions of low levels of social support the presence of illness was significantly negatively associated with parental psychological distress. It is possible that the social support that was accessed or received by the parent was for assistance with illness issues and does not translate into support for parental psychological distress. Or it is possible that parents living with low levels of social support have already sought help for psychological distress and the results of that assistance are being seen here.

Chronic illness and child behavior problems

The presence of a chronic illness significantly increases the chance of a child having behavior problems. The current findings are similar to a large epidemiological German study (n= 4,363) of six year olds that found chronic illness to be a significant indicator of child behavior problems (Haffner, et al., 2002). Similarly Klinnert and associates (2000) found that parents of children living with asthma reported more behavior problems than parents of children not living with asthma. Although research points to the relationship between the presence of a chronic illness and child behavior problems, the cross-sectional nature of the current data prevents discussion of causation. Did the children already have behavior problems before the diagnosis of illness or did the illness create the behavior problems?

Although there was a relationship found between the presence of chronic illness and child behavior problems, it is important to examine the index scores for children living with and without a chronic illness. The Child Behavior Problem index has a possible score range from 30 to 90. Children living with a chronic illness had an average score on the child behavior index of 40.8 and children not living with an illness had an average score of 39.3 ($t(1320.8)=-3.6$, $p <.00$). Although these two means differ significantly statistically, this difference may not be truly meaningful.

The data do not provide information about how and why illness increases child behavior problems. Do the children complain about their medical regimen, pout or have temper tantrums when they have doctor appointments or are prevented from engaging in activities with peers? One could imagine that the child is having a normal reaction to adverse stimuli, but parents may interpret these behaviors as a form of disobedience or as behavior problems. Similarly, noncompliance issues (e.g., not following a proscribed diet, not taking medicine in a timely fashion) may also be considered by parents to be a form of behavior problems (Gartstein, Noll & Vannatta, 2000).

There was no moderation of social support and no significant difference between low and mid to high levels of support in the relationship between the presence of chronic illness and child behavior problems. It is possible that if the *child's* rather than the parent's perceived levels of social support were assessed and used in the examination of social support moderation a difference would be found among groups. The social support that was analyzed was perceived parental support.

This support may not "trickle down" to decrease the influence of the presence of illness on child behavior problems.

Economic strain and parental psychological distress

Parents experiencing economic strain have a significantly higher chance of also having parental psychological distress. Economic strain may be a constant stressor that is omnipresent. This constant stress can then lead to psychological distress. There is strong support for this relationship in the literature (Belle, 1990; Conger, et al., 1992; Conger, Ebert, Sun, Simons, McLoyd, & Brody, 2002; Elder, 1998; Jackson, et al., 2000; Kwon & Rueter, 2003; Lorenz, et al., 1994; Simons, et al., 1993; Vinokur, et al., 1996; Voydanoff & Donnelly, 1998). The association between economic strain and parental psychological distress has been found in many different studies. For example, Simons, et al. (1993) looked at 451 two-parent families from Iowa who were all Caucasians from rural areas. The average income for these families was $29,642 (Simons, et al., 193). Conger, et al. (2002) examined the influence of economic strain on parental distress in 422 African American families (two caregivers in household, 39 percent married, remaining percentage were different dyads) from Iowa and Georgia. The average income for these families ranged between $8,000 and $9,000 depending on locality (Conger, et al., 2002). Because the current data are cross-sectional, it is impossible to know which came first, the strain or the distress; however, the results are consistent with a large body of previous longitudinal research.

The moderation of social support was contrary to expectations. Economic strain has a larger increase on parental psychological distress under conditions of mid to high levels of social support than under conditions of low levels of social support. Parents reporting mid to high levels of social support have significantly higher levels of economic strain than parents living with low levels of social support. This difference in index scores may create the larger path magnitude for mid to high levels of social support. Additionally it is possible that higher levels of social support are more costly in time and money than lower levels of social support. For example, reciprocating birthday presents or meals when the family is already experiencing economic strain may add to the parental psychological distress.

Child health stress and parental psychological distress

Higher levels of child health stress significantly decrease the chances of parental psychological distress. This finding is contrary to expectations. It is possible that parents may seek or receive additional supports when their child is experiencing health stress. The data indicate that parents with higher levels of social support also have children living with more health stress. This additional support may prevent the child's health stress from negatively influencing parental psychological distress.

Another possible explanation for the relationship between child health stress and parental psychological distress may be the items that make up the child health stress index. It is possible that the items were not severe enough to create true psychological distress. More severe child health stresses might include the number

of hospitalizations and emergency room or urgent care center visits that occur within a year due to the illness or questions about the complications the illness may create. Alternatively, the items comprising the child health stress variable may be more related to the child's personal experience of health stress. This personal experience of stress may not be shared with the parent. Items that might tap child health stress that could influence parental psychological distress may include the daily hassles created by the presence of illness or the amount of time that is required weekly to maintain the illness.

If the child's health stress is severe it could be that the parent may not have the time or ability to have psychological distress. Similar relationships have been observed in people living in war zones (Friedman, 1995). For example, doctors found that individuals living in Beirut in the early 1980s, who were also living with depression, had improvements in their mental health during the war, but their mental health returned to prewar levels after the war had ended (Friedman, 1995). The individuals living with depression stated that they had to focus on survival and not on their mental status (Friedman, 1995).

There was no moderation of social support and no significant difference between low and mid to high levels of support in the relationship between child health stress and parental psychological distress. These results are interesting because in the total model there is a negative, significant relationship between the two variables, but when social support is examined the relationship disappears. It

may be that any form of support, whether it be low or mid to high levels, removes the negative influence of child health stress on parental psychological distress.

Economic strain and parental cognitive stimulation

Economic strain is significantly related to lower levels of parental cognitive stimulation. These findings are consistent with the existing literature (Evans, 2004; Guo & Harris, 2000; Miller & Davis, 1997). Economic strains may cause families to adjust their discretionary spending. Therefore, families that are experiencing economic strain may not have the ability to provide a cognitively stimulating environment, such as books, musical instruments, equipment for hobbies, or museum visits (Evans, 2004; Garrett, et al., 1994; Klebanov, et al., 1994).

Under conditions of mid to high levels of social support the relationship between economic strain and parental cognitive stimulation was buffered. Findings reveal that parents with mid to high levels of social supportprovide significantly more cognitive stimulation to their children than parents living with low levels of social support. When parents have low levels of social support and economic strain they may not have the time or ability to provide their child with cognitive stimulation. Parents with mid to high levels of social support may utilize the support system to supply cognitive stimulation to their child. For example, individuals in the system may take the child to a museum, encourage hobbies, or even provide cognitive materials (e.g., books, craft materials).

Economic strain and parental involvement

Parental involvement is not directly decreased by the presence of economic strain. Thus, the mere presence of economic strain does not influence how involved parents are with their children. The parental involvement scale includes six home-based items (13 items total) that do not require resources and are based on household maintenance (e.g., washed or folded clothes together and cleaned the house together). Parents may continue to do chores and find time to participate in additional "fun" activities with their children even with the presence of economic strain. This indicates that parents may be successful at preventing financial strains from directly interfering in their time spent with their children.

Parental involvement may be influenced by other factors that are related to economic strain, but were not examined in the current study. For example, parents may need to work overtime or take additional jobs to handle economic strains. These hours away from the home may significantly decrease the level of involvement parents have with their children.

There was no moderation of social support and no significant difference between low and mid to high levels of support in the relationship between economic strain and parental involvement. The path between the two variables is significant for both low and mid to high levels of support. This is interesting because there is no relationship observed in the total model. It may be that when economic strain is present individuals behave similarly (e.g., work more hours) whether they have low or mid to high levels of social support.

Child health stress and child behavior problems

Health stress in children's lives was found to be related to significantly more behavior problems. Living with a chronic illness may already be difficult for a child, but with the addition of health stresses (e.g., activity limitations, and schoolwork and attendance problems) a child may become frustrated and act out (Ellerton, et al., 1996) or become withdrawn and quiet (Rodder, et al., 2003). For example, if a child is unable to participate in physical activities, classmates may tease him/her (Bukowski & Anita, 2000; Underwood, 1997). If the child is absent for long periods of time due to health problems his/her relationship with other children may not develop and the child living with the illness may become withdrawn or considered an outcast by fellow peers.

The moderation of social support was contrary to expectations. Under conditions of mid to high levels of social support child health stress is positively and significantly related to child behavior problems, whereas under conditions of low levels of social support there is only a marginal positive relationship between the variables. Parents who reported higher levels of social support also reported higher levels of child health stress. It is possible that the support system activated by the family to assist with higher levels of child health stress have not yet begun to work. Or it is possible that parental perceived support does not successfully moderate the relationship between child health stress and behavior problems, but higher levels of perceived social support received by the child would moderate the relationship.

Parental psychological distress and parenting behaviors

When parents are living with psychological distress their levels of positive parenting significantly decrease. Specifically higher levels of parental psychological distress were associated with less cognitive stimulation, emotional support, and warmth. It may be difficult for parents to nurture their children when their own lives are in emotional turmoil (Conger, et al., 1992; Simons, et al., 1992; Voydanoff & Donnelly, 1998). These findings are consistent with the existing literature on parental psychological distress and parenting behaviors (Conger, et al., 1992; Conger, et al., 2002; Downey & Coyne, 1990; Jackson, et al., 2000; Simons, et al., 1992; Voydanoff & Donnelly, 1998). The literature that supports these findings has drawn from samples that are nationally representative (Voydanoff & Donnelly, 1998), African American (Conger, et al., 2002), and Caucasian (Simons, et al, 1992).

Unexpectedly, there was no relationship between parental psychological distress and parental involvement. It is possible that parental involvement may not require nurturing behaviors, which are diminished when psychological distress is present (Conger, et al., 1992; Simons, et al., 1992; Voydanoff & Donnelly, 1998). Nurturing may not be included in many of the involvement items included in the study measure, such as household chores and errands. These activities are necessary for family functioning and cannot stop if psychological distress is present. Additionally this form of involvement may place minimal additional stress on the parent.

The moderation of social support on the relationship between parental psychological distress and parenting behaviors is mixed. The relationship between parental psychological distress and parental cognitive stimulation and parental psychological distress and parental warmth indicates that there is no relationship between the variables under conditions of low levels of social support, but under conditions of mid to high levels of support there is a significant negative relationship between the variables. It may be that when parents have high levels of social support they must expend energy to that network which may detract from their positive parenting behaviors. Also, it may be that individuals that have lower levels of social support actually have better quality supports for their problems, which may then prevent their problems from influencing parenting behaviors.

The relationship between parental psychological distress and parental emotional support is negative and significant for both support groups. However, under conditions of low levels of support the magnitude of the negative relationship between psychological distress and emotional support is greater than under conditions of mid to high levels of social support. The emotional support scale taps discipline, chores, and how the primary caregiver speaks with the child. It is possible that under conditions of mid to high levels of social support these more basic parenting behaviors are not disturbed as much as under conditions of low levels of social support.

There was no moderation of social support and no significant difference between low and mid to high levels of support in the relationship between parental

psychological distress and parental involvement. This relationship between parental psychological distress and parental involvement was also observed in the total model. Thus, the moderation of social support for the relationship between parental psychological distress and parenting behaviors is mixed, with one expected relationship and three unexpected relationships.

Parental psychological distress and child behavior problems

Parental psychological distress was found to significantly increase child behavior problems. These findings are consistent with the current literature on parental psychological distress and behavior problems in children (Conger, et al., 1995; Conger, et al., 2002; Downey & Coyne, 1990; Drotar, 1997; Jackson, et al., 2000; Lee & Gotlib, 1989; Richters & Pellegrini, 1989; Rogers & Floyd, 2003). The samples from this literature vary from single, low income, African American mothers (Jackson, et al., 2000) to predominately two-parent, working class, Caucasian families (Conger, et al., 1995). Parents clearly have a direct effect on their children's behavior, and also have indirect influences through their parenting behavior. Current findings indicate that parental psychological distress also significantly influences child's behavior problems indirectly through parenting behaviors.

The moderation of social support on the relationship between parental psychological distress and child behavior problems was contrary to expectations. There is a larger relationship between the variables under conditions of mid to high levels of social support than under conditions of low levels of social support. This

relationship may speak to the type of support sought and received by the parent. It is possible that the parent seeks assistance for dealing with the presence of illness, but has not sought help for their individual well-being. This may help to explain why higher levels of support are associated with a larger relationship between parental psychological distress and child behavior problems.

Parenting behaviors and child behavior problems

In the current study parental cognitive stimulation and warmth significantly decreased child behavior problems. These findings are consistent with the current research on parental cognitive stimulation and warmth and their relation to behavior problems (Eisenberg, et al., 2001; Jackson, et al., 2000; Minden, 1999; Moris, et al., 2003; Parcel & Menaghan, 1993; Rogers, et al., 1991; Yeung, et al., 2002; Zhou, et al., 2002). The samples from this literature range from predominantly middle class, Caucasian families (Eisenberg, et al., 2001) to single, African American mothers (Jackson, et al., 2000).

Surprisingly, parental involvement was related to significantly higher levels of child behavior problems. Based on the current data it is impossible to sort out causation. Are the parents increasing their involvement with their child because the child has a behavior problem to begin with or is the involvement of the parent creating the behavior problems? It is also possible that a third factor that was not assessed is contributing to both parental involvement and child behavior problems.

The moderation of social support on the relationship between parenting behaviors and child psychological distress is mixed. The relationship between

parental cognitive stimulation and child behavior problems is contrary to expectations. Under conditions of low levels of social support cognitive stimulation is associated with a significant decrease in child behavior problems. However, under mid to high levels of support there is no relationship between the variables. This relationship is surprising because parents receiving mid to high levels of social support also report providing significantly more cognitive stimulation than parents receiving low levels of social support. It is possible that although more cognitive stimulation is provided it may not be considered quality or desired stimulation by the child. For example, it could be that when mid to high levels of social support are present those supports are interacting with the child in cognitively simulating ways. Whereas when the parent receives low levels of support, the parent may be the one providing the stimulation. It is possible that parental simulation may be more helpful for children than when others provide the cognitive stimulation.

There was no moderation of social support and no significant difference between low and mid to high levels of support in the relationship between parental emotional support and child behavior problems. This relationship is consistent with observations in the total model.

The relationship between parental warmth and child behavior problems is negative and significant for both support groups. However, under conditions of low levels of support the magnitude of the negative relationship between warmth and behavior problems is greater than under conditions of mid to high levels of social support. Parents may be receiving emotional support from their social network, this

support may then parlay into their ability to provide more parental warmth. Findings indicate that there are significantly higher levels of parental warmth when mid to high levels of social support are present than low levels of social support.

The relationship between parental involvement and child behavior problems is contrary to expectations. Under conditions of mid to high levels of social support parental involvement is positively and significantly related to child behavior problems, while under conditions of low levels of social support there is no relationship between the variables. It is possible that parents receiving higher levels of support are activating their support networks to assist in dealing with child behavior problems. This larger network may then allow parents to be more involved with their child. However causation is unclear. Did the involvement come first or the behavior problems? Thus, the moderation of social support for the relationship between parenting behaviors and child behavior problems is mixed, with one expected relationship and three unexpected relationships.

Chronic illness and child behavior problems

The deficit model says that the mere presence of a chronic illness creates devastating effects for children. The current research did not find full support for this assumption. Although there is a significant link between the presence of a chronic illness and child behavior problems, the magnitude of that relationship is smaller than other variables. The standardized coefficient for the path between the presence of a chronic illness and child behavior problems is $\beta = .079$, whereas the coefficient between child health stress and child behavior problems is $\beta = .306$ and

parental psychological distress and child behavior problems $\beta = .326$. Therefore, when child health stress and parental psychological distress are present they contribute more to child behavior problems than the presence of a chronic illness. This speaks to the importance of mediating factors and the need to examine the magnitude of paths as well as the significance level.

The effect size of the presence of illness on child behavior problems is important to examine. Cohen (1965) defines effect size as the extent to which a relationship exists. A small effect size is considered to be $.25\sigma$ (Cohen, 1965). The effect size for the direct relationship between the presence of illness and child behavior problems is very small ($.165\sigma$). Therefore, it could be argued that the relationship between the presence of illness and child behavior problems is also very small.

The indirect effects of chronic illness on child behavior problems were explored and are not significant. This is because the effects of illness on economic strain are practically zero and the effects of illness and child health stress on psychological distress are the reverse of that expected.

Overall the current research finds that there is a connection between the presence of illness and child behavior problems, but, based on the small effect size and small, nonsignificant indirect effects, I am not convinced that illness presence is as detrimental to children as was once thought. The presence of illness in childhood does bring additional challenges and strains, but families and children are resilient and find ways to prevent the illness from creating negative outcomes. The current

research points to the need for additional research to further assess the relationship between chronic illness and child behaviors.

Social support

Social support was thought to moderate or buffer each of the relationships in the current research. The findings reveal that this was not the case. Instead 5 of the 18 possible relationships were successfully buffered by social support. Eight of the 18 relationships show a reverse buffering with lower levels of social support being more beneficial. However, the fact that buffering was observed is significant considering the limitations of the measure and the use of a median split.

The social support measure that was used in this research had many limitations. The social support index was based on two items. These two items, one tapping advice and emotional support and the other physical help and assistance, clearly did not tap all of the dimensions of social support. Along with the limited number of items, participants were limited in the number of individuals they could include in their support network, which decreased variability. The measure also did not provide intensity information, such as how helpful these people are to the participant. Participants may have 10 people in their support network, but these individuals may not actually provide necessary assistance.

The social support index was split into two groups using a median split. It is possible that splitting the participants in a different way would yield more buffering affects of social support. For example, the groups might be split into no support (a zero score on the index) and some support (a score of one or more on the index).

Utilizing a more comprehensive measure and creating a more meaningful group split may assist in forming a more clear picture of the moderating influence of social support, but it would also be important to understand the reason parents are contacting social supports. For example, could it be that people seek out help for particular problems or do family members and friends insist on helping parents through tough times even if no assistance was asked for? These supports may intrude on family life, disrupting family patterns as well as providing support. The support that is provided, whether sought for or given, may create additional stresses for parents because of the costs associated with reciprocity (Taylor, Chatters, Tucker & Lewis, 1990). It may be stressful for parents already living with strain to reciprocate the support they are given.

Finally, it may be that advice and emotional support buffer some of the relationships in the model and actual help and assistance buffer other relationships. In this study both types of support were considered together. Future research should examine the potential buffering effect of the two different forms of support and other potential forms as well.

Even with these limitations social support was found to buffer two of the most important relationships in the model, presence of illness and economic strain and presence of illness and child health stress. These relations are the most important because they are part of the basis for the model. With the relationship between presence of illness and economic strain and presence of illness and child health stress cut, the presence of illness does not influence additional variables in the

model. Therefore, social support is important for all families, but particularly for families living with a chronic illness. If the family is able to receive sufficient supports the chronic illness may not negatively influence later family and individual processes such as psychological well-being and parenting behaviors.

It is important to mention that there are problems with interpreting the buffering or moderating influence of social support. Because the data are cross-sectional there is speculation as to which came first, the stresses or the social support. Did the parents have the support and then the stress entered their life or did the stress occur and the parents sought out support for assistance? Future research that examines longitudinal data will help to answer this question.

Ecological theory

The ecological theoretical model was used in the current research because it best addresses the contextual factors associated with chronic illness and how the illness affects the individual and the family (Kazak & Christakis, 1994; Vinson 2002). The ecological model states that the environment and families are mutually shaping systems, each changing with time, and adapting to changes in the other (Bronfenbrenner, 1986). These systems interact and influence each other in a reciprocal fashion. This interaction was observed in the direct and indirect effects in the current research. Both the direct and indirect effects point to the interaction of microsystems. For example, children's health stress is associated with parents' psychological distress and the parents' distress is then related to child behavior

problems. The interaction observed in the current research lends support to the ecological model.

The ecological model explains that events external to the family unit are just as influential as the activities inside the family unit and inside the individual family member (Bronfenbrenner, 1986). The model acknowledges there are barriers to optimal family functioning both on the individual level (e.g., mental health) and the employer and government level (e.g., health insurance coverage, family leave). The interaction between the family and their various environments produces both opportunities and risks.

There are opportunities in the microsystem (e.g., parenting behaviors) and mesosystem (e.g., social support). These opportunities may help to decrease or lessen the influence of risk. Risks were examined in the microsystem and include child health stress and parental psychological distress. The ecological model recognizes and the current research supports that systems interact allowing risks and opportunities from one system to influence the other (Bronfenbrenner, 1986).

In addition to the microsystem and mesosystem, there are opportunities and risks in the exosystem and macrosystem even though they were not examined in the current research. For example, flexible work schedules (exosystem) might be considered opportunities because they may help parents to schedule doctor visits or tend to their child when they become ill. Risks might include stigma and stereotypes (macrosystem) about illness that are present in society. Clearly all of the systems

(micro, mesos, exo, macro) and opportunities and risks interact in the current research, thus further lending support to the ecological model.

Family stress theory of economic hardship

The family stress theory of economic hardship posits that economic strain directly influences parental psychological distress and indirectly influences parental conflict, positive parenting, and finally child behavior (Conger, Rueter, & Conger, 2000). Researchers have found strong support for this model (Conger, et al. 2000; Conger, et al., 2002; Jackson, et al., 2000; Simons, et al., 1993; Vinokur, et al., 1996; Voydanoff & Donnelly, 1998). Parental conflict was not included in the model that was analyzed in the current study, but each of the other relationships suggested in the family stress theory was supported. This research adds to the family stress theory with the addition of child chronic illness and child health stresses as potential sources of family strain.

Implications for Researchers, Practitioners, and Policy Makers

The findings from this study have implications for researchers, practitioners, and policymakers. Researchers should continue to investigate mediating and moderating variables when examining the influence of illness on individuals and families. The use of structural equation modeling to conduct these investigations may assist in finding previously unexplored relationships and allow for testing of alternative models.

Based on the current research, children living with a chronic illness have a greater chance of experiencing behavior problems through the mere presence of

illness and child health stress than those without a chronic illness. To reduce the negative effects of health stress on children, practitioners might use individual or group therapy to discuss the stresses and strains of living with a chronic condition. Preferably, support groups with other children living with the same or similar illness could be formed. Interaction with others who are living with a similar illness can help children to not feel alone. Practitioners might begin the interaction with other children who are currently living with the illness at the time of diagnosis or shortly thereafter. Additionally, teaching the children problem solving skills such as emotion regulation (LeBlanc, Goldsmith & Patel, 2003) and disease self-management (Hill-Briggs, 2003) may assist children to decrease stresses and lead to a prevention of acting out behaviors.

Practitioners should assess developmental aspects of a child living with a chronic illness before attributing behavior problems to the illness alone. Many parents do not understand that some forms of acting out are normative to the child's developmental age. The practitioner should normalize the child's behavior if at all possible.

Compliance with medical regimens may be arduous for both children and parents. Parent-child conflict can occur when the child refuses or acts out when a treatment is necessary. Practitioners should discuss with both children and parents how to make compliance issues easier. For example, children may feel babied if they are unable to assume control of pieces of their own medical regimen.

Practitioners could discuss age-appropriate periods when parents can transfer medical regimen responsibilities to the child.

Practitioners also need to be aware of the positive influence social support can have for families living with a chronic illness. Families should be encouraged to join local affiliations of the national nonprofits that correspond with the illness they live with (e.g., Juvenile Diabetes Foundation, The Allergy and Asthma Network/Mothers of Asthmatics). Practitioners also might teach families how to ask for help effectively and how to eliminate social supports that are more draining than supportive.

This research points to the influence of parental psychological distress on child behavior problems. Practitioners should be aware of this relationship and assess parental psychological distress when a child presents with behavior problems. If parental psychological distress is found, the parent should be encouraged to receive treatment.

Parenting behaviors were found to be related to a decrease in child behavior problems. Practitioners might create group classes to teach effective parenting behaviors. For example, parenting classes might focus on how to cognitively stimulate a child. The class might suggest parents set aside time each day to read a book to their child or the class might teach how to plan a successful trip to a local museum.

Parental psychological distress was found to be related to economic strains. Program planners might create short-term, community support groups to help parents

when there are economic strains. These programs could provide emotional as well as instrumental support (e.g., how to apply for the Earned Income Tax Credit or where to go for low cost health care). Childcare and transportation would need to be provided for such a program. The supports that would be provided might assist in decreasing economic strain and eventually parental psychological distress.

Policymakers might also concentrate on economic strain or health insurance issues. Policymakers may decrease economic strain by subsidizing and locating housing, increasing and making more frequent payments of the Earned Income Tax Credit, and/or providing health insurance to low income families. Health insurance that is provided to families often does not include a mental health component. Mental health treatment coverage should be included in health insurance policies for both children and their parents.

Based on the current research, economic strain is significantly associated with increases in parental psychological distress, which in turn significantly increases child behavior problems. Child behavior problems might lead to educational difficulties (Hofferth & Curtin, 2004) that can eventually lead to difficulties later in life. Additionally, adults that had behavior problems in childhood tend to provide less cognitive stimulation to their children than adults who did not experience behavior problems in childhood (Saltaris, et al., 2004). Therefore, prevention of the possible downward spiral created by economic strain would be advisable.

Researchers, practitioners, and policymakers should also focus on the resiliency of families. This research points to positive parenting behaviors such as parental cognitive stimulation and warmth decreasing behavior problems. Additionally, some individual and family strains (e.g., economic strain, child health stress) were buffered by the presence of social support. These forms of resiliency should be encouraged and expanded through research, training of practitioners to use culturally competent models (Olkin, 1999), and the implementation of family friendly policies. Robert Louis Stevenson, who lived with pulmonary tuberculosis, might have explained resiliency in chronic illness best, "'life is not a matter of holding good cards, but of playing a poor hand well'" (Isaacs & Sewell, 2003, p. 235).

Limitations

In interpreting this study's findings, there are several limitations that should be addressed. First, the data are cross-sectional, which prevents conclusions about causality. This is particularly important with the moderation of social support. The perennial problem of which came first, the social support or the stress cannot be definitively answered. Likewise, some parents may experience constant trait like psychological distress such as a generalized anxiety disorder or dysthymia (low grade depression). However, because the data are one point in time, the direction of relationships involving traits like psychological distress cannot be analyzed.

Second, the current sample has more two-parent households than the United States population did in 1997. Ninety-four percent of the current sample were in two

parent households in 1997, leaving six percent of "other" or single parent families. In 1997, 24 percent of U.S. households were single parent families (Bryson & Casper, 1998). Single parent families may differ from dual parent families in their level of economic strain, parental psychological distress, parenting behaviors, and levels of social support. The education of the head of household and number of children in the household were controlled for during analysis. Nonetheless, the results of the current study should be applied to two-parent families.

Third, the gender of the child was not controlled for during analysis. Findings indicate that there were more females in the nonchronic sample and more males in the chronic sample. It is possible that there are differences in child health stress based on the gender of the child. For example, activity limitation for boys may cause them to act out more. This acting out may be a way for boys to expel additional energy that would normally be used during activities. Child behavior problems may be different for boys and girls with boys using externalizing behaviors and girls using internalizing behaviors. However because externalizing and internalizing behavior problems were combined in the child behavior problems measure, gender differences may not be seen.

Fourth, the chronic illnesses that are assessed in the current research, anemia, asthma, diabetes, and otitis media do not tap all of the chronic illnesses in childhood. The illnesses that were analyzed may be more benign than other unexamined illnesses. For example, recent years have seen changes in the illnesses that are considered chronic. Leukemia in children and HIV may now be considered chronic

conditions due to the creation of medications and treatment protocols. The inclusion of these illnesses that may be considered more chronic might change the outcome of the current research.

Fifth, the use of a preexisting data set limits the items and measures available for use in analysis. The PSID-CDS was not created to fully explore chronic illness in children. Therefore there are important pieces of information about diagnosis, time since diagnosis, daily hassles of illness, compliance, and the general attitude toward the illness that are not present. For example, families that have been living with the illness for many years may have adapted to the illness. This adaptation over time may then create less parental psychological distress. If more information on the chronic illness were available, the research would provide a more vivid depiction of child health stress and the influence of illness on family and individual well-being.

Further, when an instrument is present in a preexisting data set that examines a variable of interest, the measure may not be sufficient for the proposed research. For example, the social support measure restricts respondents from reporting more than five supports for instrumental and emotional support. This restriction limits the variability of the index and the index response set prevents participants from reporting how helpful that support is to them. Possibly the Family Support Scale (Dunst, Jenkins & Trivette, 1984) would be a more appropriate measure of both emotional and instrumental support for raising children. Support parents receive for caring for their children may not transfer to personal support. Therefore an additional measure, such as the Norbeck Social Support Questionnaire (Norbeck,

Lindsey & Carrieri, 1981), which examines both the number and helpfulness of the support, might be used to assess parents' personal experience of perceived levels of social support.

Additionally, with the use of preexisting data there was a reliance on existing indices. Although they are adequate, they do not provide intensity information (e.g., how stressful or how much bother you experience with economic strain). For example, the economic strain index might have asked first if you had the strains and then how stressful the strain is for the family. Some individuals may face economic strains, but have mechanisms (e.g., coping) that prevent the strains from becoming detrimental. On the other hand there are individuals who may lack these mechanisms and find the strains overwhelming. This perception of the degree of strain, rather than merely the presence of strain may provide a more clear representation of individual and family functioning.

Sixth, the social support and parental involvement measures both combine two different dimensions of the variable. The social support index collapses both instrumental and emotional support into one score. However, the different types of support may moderate paths differently based on support type. For example, instrumental support may influence the path between economic strain and psychological distress more than emotional support. Similarly, the parental involvement measure assesses both fun activities and chores. Chores may create arguments between parent and child and may cause children to act out in order to avoid completing chores. On the other hand, parents that are involved in fun

activities with their children (e.g., playing games, reading) may cause children to act out less. Therefore, interpretability of social support and parental involvement is limited due to the combination of dimensions.

Directions for future research

The current study addressed issues of the presence of a chronic illness and child behavior problems while examining the mediating influences of economic strain, child health stress, parental psychological distress, parental cognitive stimulation, parental emotional support, parental warmth, and parental involvement. Additionally the influence of low and mid to high levels of social support were explored. However, further research is needed to investigate the aforementioned variables more thoroughly and to include additional variables that may influence the relationship between the presence of illness and child behavior problems.

First, future research must expand the examination of illness to include more than the mere presence of illness. Illness should be assessed through measures of severity based on doctor, parent, and child ratings, and child health stresses such as hospitalizations, compliance/management issues, daily hassles, and attitude toward illness. The time since diagnosis should also be assessed. By providing additional measures of illness, the explanation for the connection between the presence of illness and child behavior problems may become clearer.

Second, future research should examine the differences or similarities between children living with an illness under the age of six. Younger children may be diagnosed with chronic conditions but the adjustment may be different for families

when the child does not have full language capabilities, as opposed to school age children.

Third, economic strain should be examined from both a perceived and actual experience of economic hardships. Some families may have reported "none of the above" on the economic strain index, but perceive strain. It is also possible that families who experience *actual* economic strain do not perceive themselves to have economic strain. Future research should use a combination of perceived and actual experience of economic hardship to more fully examine the possible detrimental affects of strain on parental psychological distress and parenting behaviors.

Fourth, future research should further examine parental involvement. In the current research, parental involvement with the child included both chores and fun activities. Chores, although done together, may be met with tantrums or fights between parent and child; whereas, fun activities such as reading a book or playing a game may be enjoyable for all involved. Future research should separate the two types of involvement to better examine the relationship between parental involvement and child behavior problems.

Fifth, research should obtain multiple reports of behavior problems and not simply rely on parental reports. Research has found that mothers report more aggressive behaviors in children living with a chronic illness than teachers and peers (Gartstein, et al., 2000). This may be due to medial compliance issues (Gartstein, et al., 2000) or environmental factors. Nonetheless, observational or multiple respondents would help to insure the reliability of parental responses. Additionally,

future research might explore both internalizing and externalizing behavior problems because it is possible that parental psychological distress and parenting behaviors influence these two behavior problems in differing ways.

Sixth, the measure of social support should be expanded to include both the support perceived by the parent and the perceived support the child receives. Parental support should be broken down into perceived assistance in raising the child and personal perceived support. The support the child receives should also be assessed since it has been found to improve feelings of acceptance by peers (La Greca, et al., 1995) and adherence to medical regimens (Hauser, et al., 1990; La Greca, 1992).

Additionally, instrumental and emotional support might be split into two separate measures of support. In the current research both supports were collapsed into a measure of global social support. However, each of these support types may influence paths differently. For instance, instrumental support may act as a better buffer against economic strain than emotional support. Further, it would be important for future research to assess how helpful that support is to the individual and family.

Seventh, future research should continue to examine mediating and moderating variables that influence the relationship between the presence of illness and child behavior problems. Such variables might include children's school performance, peer and sibling relations, neighborhood measures, and family conflict. For example, family conflict should also be considered when examining illness and child

behavior problems. Family conflict has been found to increase childhood anxiety and depression (Jekielek, 1998), hospitalizations in children living with asthma (Chen, Bloomberg, Fisher & Strunk, 2003), and has been a risk factor for behavior problems for children in general (Vandewater & Lansford, 1998), and in children living with sickle cell disease in specific (Thompson, et al., 1999; Thompson, et al., 2003). Additionally, parenting behaviors are negatively influenced by family conflict (Gerard & Krishnakumar, 2003; Klausli & Owen, 2003).

Eighth, longitudinal data should be collected in future research. Longitudinal data would assist in answering questions of causation. Fortunately, a second wave of data were collected in 2002, which will permit longitudinal analysis of this study in the future.

Recommendations

- Children living with a chronic illness may need assistance with adjusting to and coping with their illness. This assistance may prevent child behavior problems.
- Children living with a chronic illness may need assistance in responding to their own health stress.
- Parents need to be aware of their own mental health and seek assistance when necessary.
- Parents living with psychological distress need assistance to improve their mental health and prevent their distress from interfering with positive parenting behaviors.

- When a child is having behavior problems, parental psychological distress should be assessed.
- Families living with a child living with a chronic illness who have low levels of social support may need assistance to increase their number of supports in order to prevent the presence of illness from influencing economic strain and child health stress.

Conclusions

The current study adds to the literature on families and children living with a chronic illness. Some previous research has focused specifically on the relationship between chronic illness in childhood and increased behavior problems. While the current research did find a relationship between illness and behavior problems, the additional mediating factors of child health stress and psychological distress were found to contribute more to child behavior problems than the mere presence of illness.

The buffering effect of social support was also examined, finding that under conditions of mid to high levels of social support the relationship between illness and economic strain and illness and child health stress are buffered. This buffering effect early in the model can indirectly funnel down to other processes, such as parenting behavior. Clearly, mediating and moderating family and individual influences must continue to be examined to understand the relationship between chronic illness and child behavior problems.

Appendix A: Introductory Letter to Participants

Spring 1997

Dear_____,

Thank you for agreeing to participate in the Child Development Supplement study. This study will help researchers learn how the nation's children are faring over time. This project is funded by the national Institute of Child and Health and Human Development to gather information on how financial and social resources in the home, community and school affect children's health and achievement. We have enclosed a brochure containing additional information about the study.

One the date recorded below, the interviewer you recently talked with will come to your home to interview both you and your child/ren. The name of each child chosen for an interview is listed below. It is important that each child listed is present on the day of the interview at the scheduled time. The interview will take approximately one and a half hours per child. As part of this interview, the interviewer will be administering a standard achievement assessment. We want to make sure that we are able to test each child as accurately as possible. Because distractions tend to lower test scores, it would be best if the interview could be done in a quiet place with as few distractions as possible.

The Time Diary your interviewer mentioned is enclosed with this letter. Please note that there are two diaries for each child. Each diary should be completed on the day specified on the front cover. We appreciate your taking the time to carefully complete the diaries on each day specified. Your interviewer will pick them up at the time of your child's interview.

In appreciation for your participation in our study, we will be sending you a check for $25.00 and each child who participates will receive a small gift. Your interviewer has pledged to protect your privacy. Any information given in your interview and in your time diaries will be treated completely confidentially. If you have further questions, please don't hesitate to call us at our toll free number, 1-800-759-7947.

Sincerely,

Sandra Hofferth, Ph.D.	Pamela Davis-Kean, Ph.D.
Co-Director	Project Manager, Child Development Supplement
Family Economics Study	Family Economics Study
University of Michigan	University of Michigan

Your interviewer will be: _____
Interview Date and Time:_____

Appendix B: Economic Strain Index

In the last year, have you done any of the following or have any of the following happened as a result of economic problems? (Circle all that apply)

1. Sold possessions or cashed in life insurance
2. Postponed major purchases
3. Postponed medical care
4. Borrowed money from friends or relatives
5. Applied for government assistance
6. Filed for or taken bankruptcy
7. Fallen behind in paying bills
8. Obtained a loan to consolidate or pay off debts
9. Had a creditor call or come to see you to demand payment
10. Had your wages attached or garnished by a creditor
11. Had a lien filed against your property because you could not pay a bill
12. Had your home, car or other property repossessed
13. Moved to cheaper living quarters
14. Moved in with other people
15. Sent one or more of your children to live with someone else
16. None of the above

At the end of the month, do you end up with some money left over, just enough to make ends meet, or not enough money to make ends meet?

How many of the past 12 months was (CHILD) covered by health insurance or any other kind of health care plan?

Appendix C: Child Health Stress Index

Does (CHILD) currently have any physical or mental condition that would limit or prevent (his/her) ability to…(yes/no)

1. do usual childhood activities such as play, or participate in games or sports?
2. attend school (preschool or day care) regularly?
3. do regular school work?

In general, would you say (CHILD'S) health is excellent, very good, good, fair, or poor?

Appendix D: Non-Specific Psychological Distress Scale

During the past 30 days, how often did you…all of the time (1), most of the time (2), some of the time (3), a little of the time (4), none of the time (5)

1. Feel tired out for no good reason?
2. Feel nervous?
3. Feel so nervous that nothing could calm you down?
4. Feel hopeless?
5. Feel restless or fidgety?
6. Feel so restless you could not sit still?
7. Feel depressed?
8. Feel that everything was an effort?
9. Feel so sad nothing could cheer you up?
10. Feel worthless?

Appendix E: Home Observation for Measurement of the Environment

(children aged six to nine)

1. About how many books does (CHILD) have?

None (1), One or two (2), Three to nine (3), 10 to 19 (4), 20 or more (5)

2. How often do you read to (CHILD)? Would you say never (1), several times a year (2), several times a month (3), about once a week (4), a few times a week (5), every day (6)

3. How often is (CHILD) expected to do each of the following? Would you say almost never (1), less than ½ the time (2), about ½ the time (3), more than ½ the time (4), almost always (5)?

Make (his/her) own bed?

Clean (his/her) own room?

Clean up after spills?

Bathe (himself/herself)?

Pick up after (himself/herself)?

4. Is there a musical instrument (for example, piano, drum, guitar, etc.) that (CHILD) can use at home? (Yes/No)

5. Does your family get a daily newspaper? (Yes/No)

6. About how often does (CHILD) read for enjoyment? Would you say every day (1), several times a week (2), several times a month (3), several times a year (4), never (5)? ([if volunteered] child cannot read (6))

7. Does your family encourage (CHILD) to start and keep doing hobbies? (Yes/No)

8. Does (CHILD) participate in any extracurricular activities such as gymnastics, scouts, music lessons, a sports team, or a boys' or girls' club? (Yes/No)

9. How often has a family member taken or arranged to take (CHILD) to any type of museum (children's scientific, art, historical, etc.) within the last year? Would you say never (1), once or twice (2), several times (3), about once a month (4), more than once a month (5)?

10. How often has a family member taken or arranged to take (CHILD) to any type of musical or theatrical performance within the past year? (never (1), once or twice (2), several times (3), about once a month (4), more than once a month (5))

11. About how often does our whole family get together with friends or relatives? Would you say once a year or less (1), a few times a year (2), about once a month (3), two or three times a month (4), or about once a week or more (5)?

12. When your family watches TV together, do you (or (CHILD'S) other parent) discuss TV programs with (him/her)? (Yes/No/If volunteered, do not have a TV)

13. Most children get so angry at their parents that they say things like "I hate you" or swear in a tantrum. Please look at this list and tell me which actions you would take if this happened. [Check all that apply.]

A. Ground child

B. Spank child

C. Talk with child

D. Give (him/her) household chore

E. Ignore it

F. Send to room from more than one hour

G. Take away (his/her) allowance

H. Take away TV, phone, or other privileges

I. Put child in short "time out"

J. Other (specify)

14. Sometimes kids mind pretty well and sometimes they don't. Sometimes they do things that make you feel good and sometimes they don't. How many times in the past week have you spanked (CHILD)?

(Interview observation of home environment)

1. Primary caregiver responded verbally to (CHILD'S) speech, questions or request:

Often		Sometimes		Never
1	2	3	4	5

2. If child is older than three years of age: Primary caregiver introduced interviewer to (CHILD) by name. (Yes/No)

3. Primary caregiver's voice conveyed positive feeling about this (CHILD):

Often		Sometimes		Never
1	2	3	4	5

4. Primary caregiver spontaneously spoke or conversed with (CHILD) (excluding scolding or suspicious comments):

Often		Sometimes		Never
1	2	3	4	5

5. Interior of the home is dark or perceptually monotonous.

Very Monotonous		Somewhat		Not at all
1	2	3	4	5

6. All visible rooms in the (house/apartment) are:

Very clean		Somewhat clean		Not at all clean
1	2	3	4	5

7. All visible rooms in the (house/apartment) are:

Very clean		Somewhat cluttered		Not at all cluttered
1	2	3	4	5

8. (CHILD's) play environment is safe (no potentially dangerous health or structural hazards within child's range). EXAMPLES: Falling plaster, peeling paint, rodents, glass, poisons and cleaning materials, flames and heat, frayed electrical wires.) (Yes/No/Not observed)

Appendix F: Home Observation for Measurement of the Environment

(children aged ten and older)

1. About how many books does (CHILD) have?

None (1), One or two (2), Three to nine (3), 10 to 19 (4), 20 or more (5)

2. How often is (CHILD) expected to do each of the following? Would you say almost never (1), less than ½ the time (2), about ½ the time (3), more than ½ the time (4), or almost always (5)?

Make (his/her) own bed?

Clean (his/her) own room?

Help keep shared living areas clean and straight?

Do routine chores such as mow the lawn, help with dinner, wash dishes, etc.?

Help manage (his/her) own time (get up on time, be ready for school, etc.)?

Pick up after (himself/herself)?

3. Is there a musical instrument (for example, piano, drum guitar, etc.) that (CHILD) can use at home? (Yes/No)

4. Does your family get a daily newspaper? (Yes/No)

5. About how often does (CHILD) read for enjoyment? Would you say every day (1), several times a week (2), several times a month (3), several times a year (4), never (5)? ([if volunteered] child cannot read (6))

6. Does your family encourage (CHILD) to start and keep doing hobbies? (Yes/No)

7. Does (CHILD) participate in any extracurricular activities such as gymnastics, scouts, music lessons, a sports team, or a boys' or girls' club? (Yes/No)

8. How often has a family member taken or arranged to take (CHILD) to any type of museum (children's scientific, art, historical, etc.) within the last year? Would you say never (1), once or twice (2), several times (3), about once a month (4), more than once a month (5)?

9. How often has a family member taken or arranged to take (CHILD) to any type of musical or theatrical performance within the past year? (never (1), once or twice (2), several times (3), about once a month (4), more than once a month (5))

10. About how often does our whole family get together with friends or relatives? Would you say once a year or less (1), a few times a year (2), about once a month (3), two or three times a month (4), or about once a week or more (5)?

11. When your family watches TV together, do you (or (CHILD'S) other parent) discuss TV programs with (him/her)? (Yes/No/If volunteered, do not have a TV)

12. Most children get so angry at their parents that they say things like "I hate you" or swear in a tantrum. Please look at this list and tell me which actions you would take if this happened. [Check all that apply.]

Spank child

13. Sometimes kids mind pretty well and sometimes they don't. Sometimes they do things that make you feel good and sometimes they don't. How many times in the past week have you spanked (CHILD)?

(Interview observation of home environment)

1. Primary caregiver responded verbally to (CHILD'S) speech, questions or request:

Often		Sometimes		Never
1	2	3	4	5

2. If child is older than three years of age: Primary caregiver introduced interviewer to (CHILD) by name. (Yes/No)

3. Primary caregiver's voice conveyed positive feeling about this (CHILD):

Often		Sometimes		Never
1	2	3	4	5

4. Primary caregiver spontaneously spoke or conversed with (CHILD) (excluding scolding or suspicious comments):

Often		Sometimes		Never
1	2	3	4	5

5. Interior of the home is dark or perceptually monotonous.

Very Monotonous		Somewhat	Not at all	
1	2	3	4	5

6. All visible rooms in the (house/apartment) are:

Very clean		Somewhat clean	Not at all clean	
1	2	3	4	5

7. All visible rooms in the (house/apartment) are:

Very clean		Somewhat cluttered		Not at all cluttered
1	2	3	4	5

8. (CHILD's) play environment is safe (no potentially dangerous health or structural hazards within child's range). EXAMPLES: Falling plaster, peeling paint, rodents, glass, poisons and cleaning materials, flames and heat, frayed electrical wires.) (Yes/No/Not observed)

Appendix G: Parental Warmth Scale

About how often in the past month have you:

1. Hugged or shown physical affection to your child? Would you say not in the past month (1) one or two times in the past month (2), about once a week (3), several times a week (4), or every day (5)?
2. Told (CHILD) that you love (him/her)?
3. Spent time with (CHILD) doing one of (his/her) favorite activities?
4. Joked or played with (CHILD)?
5. Talked with (him/her) about things (he/she) is especially interested in?
6. Told (CHILD) you appreciated something (he/she) did?

Appendix H: Parental Involvement Scale

Now I'd like to ask about things you and (CHILD) did together in the past month. These things might be done together anywhere, they don't have to be done at home. For each please tell me if you did not do it in the past month with (CHILD), did it one or two times in the past month, about once a week, several times a week, or every day.

a. Washed or folded clothes together?
b. Done dishes together?
c. Gone to the store with (CHILD)?
d. Looked at books or read stories with (him/her)?
e. Talk to (him/her) about your family?
f. Prepared food together?
g. Done arts and crafts together?
h. Played sports or did outdoor activities together?
i. Cleaned the house together?
j. Built or repaired something together?
k. Worked or played on a computer or played video games with (CHILD)?
l. Worked on homework with (him/her)?
m. Played a board game or card game or done puzzles with (him/her)?

Appendix I: Behavior Problems Index

For the next set of statements, decide whether they are often true, sometimes true, or not true according to (CHILD'S) behavior.

a. (He/She) has sudden changes in mood or feelings.

b. (He/She) feels or complains that no one loves him/her.

c. (He/She) is rather high strung, tense and nervous.

d. (He/She) cheats or tells lies.

e. (He/She) is too fearful or anxious.

f. (He/She) argues too much.

g. (He/She) has difficulty concentrating, cannot pay attention for long.

h. (He/She) is easily confused, seems to be in a fog.

i. (He/She) bullies or is cruel or mean to others.

j. (He/She) is disobedient.

k. (He/She) does not seem to feel sorry after (he/she) misbehaves.

l. (He/She) has trouble getting along with other children.

m. (He/She) is impulsive, or acts without thinking.

n. (He/She) feels worthless or inferior.

o. (He/She) is not liked by other children.

p. (He/She) has a lot of difficulty getting (his/her) mind off certain thoughts. (IF NEC: has obsessions)

q. (He/She) is restless or overly active, cannot sit still.

r. (He/She) is stubborn, sullen, or irritable.

s. (He/She) has a very strong temper and loses it easily.

t. (He/She) is unhappy, sad or depressed.

u. (He/She) is withdrawn, does not get involved with others.

v. (He/She) breaks things on purpose or deliberately destroys (his/her) own or another's things.

w. (He/She) clings to adults.

x. (He/She) cries too much

y. (He/She) demands a lot of attention

z. (He/She) is too dependent on others.

aa. (He/She) feels others are out to get (him/her).

bb. (He/She) hangs around with kids who get into trouble.

cc. (He/She) is secretive, keeps things to (himself/herself).

dd. (He/She) worries too much.

Appendix J: Social Support Index

In the past month have you received any help with things like child care, transportation, repairs to your home or car, or other kinds of work around the house?

1. Yes
2. No

Who gave you this help? (Please circle up to 5 relationships. If more than 5 people helped you, choose the five that helped most often.)

1. Former spouse or partner
2. Own mother, father
3. Mother-in-law, father-in-law
4. Own grandmother, grandfather
5. Spouse's grandmother, grandfather
6. Sister, brother
7. Aunt, uncle, cousin
8. Child's other parent
9. Friend
10. Counselor, minister, other clergy
11. Members of church or other organization
12. Co-workers
13. Grown child
14. Other

In the past month, have you received any moral or emotional support such as advice or encouragement from friends or relatives?

1. Yes
2. No

Who gave you this help? (Please circle up to 5 relationships. If more than 5 people helped you, choose the five that helped most often.)

1. Former spouse or partner
2. Own mother, father
3. Mother-in-law, father-in-law
4. Own grandmother, grandfather
5. Spouse's grandmother, grandfather
6. Sister, brother
7. Aunt, uncle, cousin
8. Child's other parent
9. Friend
10. Counselor, minister, other clergy
11. Members of church or other organization
12. Co-workers
13. Grown child
14. Other

Appendix K: Correlation Matrix Total Sample

	1	2	3	4	5	6	7	8	9
1.	---								
2.	-.012	---							
3.	.102***	.067*	---						
4.	-.074**	.228***	-.032	---					
5.	.018	-.094***	-.070*	-.130***	---				
6.	.059*	-.090**	.055	-.190***	.127***	---			
7.	.081**	.083**	.017	-.082**	.270***	-.025	---		
8.	.028	.002	.013	-.042	.332***	.080**	.493***	---	
9.	.067*	.177***	.232***	.324***	-.224***	-.057*	-.244***	-.107***	---

I.

Note: 1=Presence of illness. 2=Economic strain. 3=Health stress. 4=Parental psychological distress. 5=Parental cognitive stimulation. 6=Parental emotional support. 7=Parental warmth. 8=Parental involvement. 9=Child behavior problems. N= 1214. *p<.05. **p<.01. ***p<.001. (2-tailed)

Appendix L: Correlation Matrix Low Levels of Social Support

	1	2	3	4	5	6	7	8	9
1.	---								
2.	.057	---							
3.	.205***	.147***	---						
4.	-.130***	.097*	-.036	---					
5.	-.102*	-.181***	-.021	-.055	---				
6.	.061	-.083*	.027	-.268***	.197***	---			
7.	.037	.065	-.026	-.036	.211***	-.103*	---		
8.	.044	-.060	.056	-.064	.336***	.044	.472***	---	
9.	.083*	.241***	.051	.200***	-.191***	-.149***	-.169***	-.138***	---

II.

Note: 1=Presence of illness. 2=Economic strain. 3=Health stress. 4=Parental psychological distress. 5=Parental cognitive stimulation. 6=Parental emotional support. 7=Parental warmth. 8=Parental involvement. 9=Child behavior problems. N= 718. *p<.05. **p<.01. ***p<.001 (2-tailed)

Appendix M: Correlation Matrix Mid to High Levels of Social Support

	1	2	3	4	5	6	7	8	9
1.	---								
2.	-.112**	---							
3.	.025	-.002	---						
4.	-.027	.333***	-.043	---					
5.	.123**	-.087*	-.132**	-.253***	---				
6.	.056	-.110**	.073	-.111**	.038	---			
7.	.132***	.078	.040	-.170***	.370***	.053	---		
8.	.028	.015	-.019	-.045	.334***	.112**	.546***	---	
9.	.043	.119**	.352***	.459***	-.282***	.026	-.375***	-.087*	---

III.

Note: 1=Presence of illness. 2=Economic strain. 3 = Health stress. 4=Parental psychological distress. 5=Parental cognitive stimulation. 6=Parental emotional support. 7=Parental warmth. 8=Parental involvement. 9=Child behavior problems. N= 675. *p<.05. **p<.01. ***p<.001 (2-tailed)

Appendix N: Error Corrections for Total Sample, and Low and Mid to High Levels of Social Support

Total sample

Error correction with estimated error variances for economic strain (1.12), child health stress (0.07), parental psychological distress (3.18), parental cognitive stimulation (1.26), parental emotional support (0.56), parental warmth (2.32), parental involvement (13.99), and child behavior problems (6.98).

Low levels of social support

Error correction with estimated error variances for low levels of social support for economic strain (1.01), child health stress (0.06), parental psychological distress (3.08), parental cognitive stimulation (1.28), parental emotional support (0.54), parental warmth (2.44), parental involvement (13.95), and child behavior problems (6.75).

Mid to high levels of social support

Error correction with estimated error variances for mid to high levels of social support for economic strain (1.21), child health stress (0.09), parental psychological distress (3.25), parental cognitive stimulation (1.26), parental emotional support (0.55), parental warmth (2.13), parental involvement (13.47), and child behavior problems (6.99).

References

Achenbach, T., & Edelbrock, C. (1981). Behavioral problems and competencies reported by parents of normal and disturbed children aged four though sixteen. *Monographs for the Society for Research in Child Development, 46*(1, Serial No. 188).

Allison, P. D. (2002). *Missing data.* Thousand Oaks, California: Sage University Paper.

Amato, P. R., & Rivera, F. (1999). Parental involvement and children's behavior problems. *Journal of Marriage and the Family, 61*(2), 375-384.

Amer, K. S. (1999). Children's adaptation to insulin dependent diabetes mellitus: A critical review of the literature. *Pediatric Nursing, 25*(6), 627-639.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders (4th ed., text revision).* Washington D.C.: Author.

Anthony, K. K., Gil, K. M., & Schanberg, L. E. (2003). Brief report: Parental perceptions of child vulnerability in children with chronic illness. *Journal of Pediatric Psychology, 28*(3), 185-190.

Asmussen, L., Olson, L. M., & Sullivan, S. A. (1999). 'You have to live it to understand it..' Family experiences with chronic otitis media in children. *Ambulatory Child Health, 5,* 303-312.

Atkin, K., & Ahmad, W. I. U. (2000). Family care-giving and chronic illness: How parents cope with a child with a sickle cell disorder or thalassaemia. *Health and Social Care in the Community, 8*(1), 57-69.

Auinger, P., Lanphear, B. P., Kalkwarf, H. J., & Mansour, M. E. (2003). Trends in otitis media among children in the United States. *Pediatrics, 112*(3), 514-520.

Babbie, E. (2001). *The practice of social research (9th ed.).* Belmont, CA: Wadsworth/Thompson Learning.

Baker, P. C., Keck, C. K., Mott, F. L., & Quinlan, S. V.(1993). *NLSY child handbook revised edition: A guide to the 1986-1990 National Longitudinal Survey of Youth Child Data.* Columbus, Ohio: Center for Human Resource Research, The Ohio State University.

Baker, P. C., & Mott, F. L. (1989, June). *NLSY child handbook 1989: A guide and resource document for the National Longitudinal Survey of Youth 1986 Child Data* (Center for Human Resource Research, pp. 1-463). The Ohio State University.

Barbarin, O. A., Hughes, D., & Chesler, M. A. (1985). Stress, coping, and marital functioning among parents of children with cancer. *Journal of Marriage and the Family, 47*(2), 473-480.

Barbarin, O. A., Whitten, C. F., Bond, S., & Conner-Warren, R. (1999). The social and cultural context of coping with sickle cell disease: II. The role of financial hardship in adjustment to sickle cell disease. *Journal of Black Psychology, 25*(3), 294-315.

Barlow, J., Harrison, K., & Shaw, K. (1998). The experience of parenting in the context of juvenile chronic arthritis. *Clinical Child Psychology and Psychiatry, 3*(3), 1359-1045.

Barlow, T. (1997, October). Managed care for children with disabilities and the interface of legislative policies. In *PREL Briefing Paper* (Pacific Resources for Education and Learning, pp. 1-9). Honolulu, HI.

Barrera, M. (1986). Distinctions between social support concepts, measures, and models. *American Journal of Community Psychology, 14*(4), 413-443.

Bedell, J. R., Giordani, B., Amour, J. L., Tavormina, J., & Boll, T. (1977). Life stress and the psychological and medical adjustment of chronically ill children. *Journal of Psychosomatic Research, 21,* 237-242.

Belle, D. (1990). Poverty and women's mental health. *American Psychologist, 45*(3), 385-389.

Belsky, J. (1984). The determinants of parenting: A process model. *Child Development, 55,* 83-96.

Belsky, J., & Vondra, J. (1989). Lessons from child abuse: The determinants of parenting. In D. Cicchetti & V. Carlson (Eds.), *Child maltreatment: Theory and research on the causes and consequences of child abuse and neglect* (pp. 153-202). New York: Cambridge University Press.

Benson, C. (2001, July). *America's children: Key national indicators of well-being, 2001*. Washington D.C.: Federal Interagency Forum on Child and Family Statistics.

Bentler, P. M. (1997). *EQS 5.7.* Encino, California: Multivariate Software, Inc.

Blackwell, D. L., Vickerie, J. L., & Wondima, E. A. (2003, October). *Summary health statistics for US children: National Health Interview Survey 2000* (Vital and Health Statistics: Series 10, Number 213). Retrieved October 14, 2003, from http://www.cdc.gov/nchs/data/series/sr_10/sr10_213.pdf.

Blum, R. W., Garell, D., Hodgman, C. H., & Slap, G. B. (1993). Transition from child-centered to adult health-care systems for adolescents with chronic conditions: A position paper of the Society for Adolescent Medicine. *Journal of Adolescent Health, 14*, 570-576.

Bollen, K. (1989). *Structural equations with latent variables.* New York: Wiley.

Bradley, R. H., Caldwell, B. M., Rock, S. L., Ramey, C. T., Barnard, K. E., Gray, C., Hammond, M. A., Mitchell, S., Gottfried, A. W., Siegel, L., & Johnson, D. L. (1989). Home environment and cognitive development in the first three years of life: A collaborative study involving six sites and three ethnic groups in North America. *Developmental Psychology, 25*(2), 217-235.

Bronfenbrenner, U. (1986). Ecology and the family as context for human development:. *Developmental Psychology, 22*(6), 723-742.

Brooks, D. (2001). Bridging the gaps in chronic illness care for children. *Disease Management Advisor, 7*(5), 65-69.

Brown, R. T., & DuPaul, G. J. (1999). Introduction to the mini-series: Promoting school success in children with chronic medical conditions. *School Psychology Review, 28*(2), 175-181.

Bryson, K., & Casper, L. M. (1998, April). Household and family characteristics: March 1997. *Current population reports: Population characteristics*. Retrieved May 24, 2004, from http://www.census.gov/prod/3/98pubs/p20-509.pdf

Bukowski, E., & Anita, L. (2000). Children's perceptions of chronically ill peers: An investigation of salient illness characteristics and social context. *Age Differences, Human Sex Differences, Psychosocial Factors Dissertation Abstract.* (From *PsycInfo*).

Cadman, D., Boyle, M., Szatrnari, P., & Offord, D. (1987). Chronic illness, disability, and mental and social well-being: Findings of the Ontario Child Health Study. *Pediatrics, 79*(5), 805-814.

Cadman, D., Rosenbaum, P., Boyle, M., & Offord, D. R. (1991). Children with chronic illness: Family and parent demographic characteristics and psychosocial adjustment. *Pediatrics, 87*(6), 884-889.

Caldwell, B. M., & Bradley, R. H. (1984). *Home observation for measurement of the environment.* Little Rock, AR: University of Arkansas at Little Rock.

Cameron, K., & Gregor, F. (1987). Chronic illness and compliance. *Journal of Advanced Nursing, 12,* 671-676.

Canning, R. D., Harris, E. S., & Kelleher, K. J. (1996). Factors predicting distress among caregivers to children with chronic medical conditions. *Journal of Pediatric Psychology, 21,* 735-749.

Ceballo, R., & McLoyd, V. C. (2002). Social support and parenting in poor, dangerous neighborhoods. *Child Development, 73*(4), 1310-1321.

Centers for Disease Control and Prevention. (2002, October 11). Iron Deficiency - United States, 1999-2000. *Morbidity and Mortality Weekly Report, 51*(40), 897-899. Retrieved October 14, 2003, from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5140a1.htm#tab2.

Charron-Prochownik, D., & Kovacs, M. (2000). Maternal health-related coping patterns and health and adjustment outcomes in children with type one diabetes. *Children's Health Care, 29*(1), 37-45.

Chen, E., Matthews, K. A., & Boyce, W. T. (2002). Socioeconomic differences in children's health: How and why do these relationships change with age? *Psychological Bulletin, 128*(2), 295-329.

Chen, E., Bloomberg, G. R., Fisher, E. B. J., & Strunk, R. C. (2003). Predictors of repeat hospitalization in children with asthma: The role of psychosocial and socioenvironmental factors. *Health Psychology, 22*(1), 12-18.

Chen, M., & Land, K. C. (1986). Testing the health belief model: LISREL analysis of alternative models of causal relationships between health beliefs and preventative health behavior. *Social Psychology Quarterly, 49,* 45-69.

Chernoff, R. G., List, D. G., DeVet, K. A., & Ireys, H. T. (2001). Maternal reports of raising children with chronic illnesses: The prevalence of positive thinking. *Ambulatory Pediatrics, 1*(2), 104-107.

Cohen, J. (1965). Some statistical issues in psychological research. In B. B. Wolman (Ed). *Handbook of clinical psychology*, pp. 95-121. New York: McGraw-Hill

Cohen, S., Gottlieb, B. H., & Underwood, L. G. (2001). Social relationships and health: Challenges for measurement and intervention. *Advances in Mind-Body Medicine, 17*(2), 129-142.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310-357.

Coiro, M. J. (1997, April). *Maternal depressive symptoms as a risk factor for the development of children poverty.* Presented at the Biennial Meeting of the Society for Research in Child Development, Washington, DC.

Coiro, M. J., Zill, N., & Bloom, B. (1994, December). *Health of our nation's children* (Vital and Health Statistics: Series 10, Number 191). Retrieved October 14, 2003, from http://www.cdc.gov/nchs/data/series/sr_10/sr10_191.pdf.

Conger, R.D., Ebert, C., Sun, L, Simons, R. L., McLoyd, V. C., & Brody, G. H. (2002). Economic pressure in African American families: A replication and extension of the Family Stress Model. *Developmental Psychology, 38*(2), 179-193.

Conger, K. J., Rueter, M. A., & Conger, R. D. (2000). The role of economic pressure in the lives of parents and their adolescents: The Family Stress Model. In L. J. Crockett & R. K. Silbereisen (Eds.), *Negotiating adolescence in times of social change* (pp. 201-223). New York: Cambridge University Press.

Conger, R. D., Conger, K. J., Elder, G. E., Lorenz, F. O., Simons, R. L., & Whitbeck, L. B. (1992). A family process model of economic hardship and adjustment of early adolescent boys. *Child Development, 63,* 526-541.

Conger, R. D., & Elder, G. H. (1994). *Families in troubled times: Adapting to change in rural America.* Hawthorne, NY: Aldine de Gruyter.

Conger, R. D., Patterson, G. R., & Ge, X. (1995). It takes two to replicate: A mediational model for the impact of parents' stress on adolescent adjustment. *Child Development, 66,* 80-97.

Conger, R. D., Elder, G. H., Lorenz, F. O., Conger, K. J., Simons, R. L., Whitbeck, L. B., Huck, S., & Melby, J. N. (1990). Linking economic hardship to marital quality and instability. *Journal of Marriage and the Family, 52,* 643-656.

Cooke, B. D., Rossman, M. M., McCubbin, H. I., & Patterson, J. M. (1988). Examining the definition and assessment of social support: A resource for individuals and families. *Family Relations, 37,* 211-216.

Cosica, J. M., Christensen, B. K., Henry, R. R., Wallston, K., Radcliffe, J., & Rutstein, R. (2001). Effects of home environment, socioeconomic status, and health status on cognitive functioning in children with HIV-1 infection. *Journal of Pediatric Psychology, 26*(6), 321-329.

Dadds, M. R., Stein, R. E. K., & Silver, E. J. (1995). The role of maternal psychological adjustment in the measurement of children's functional status. *Journal of Pediatric Psychology, 20*(4), 527-544.

Dean, A., Lin, N., & Ensel, W. M. (1981). The epidemiological significance of social support systems in depression. *Research in Community and Mental Health, 2,* 77-109.

Department of Human Services Center for Population Studies in Epidemiology. (2002). The Kessler Psychological Distress Scale (K10). *Brief Reports*(14). Retrieved from www.dhs.sa.gov.au/pehs/PROS/br-kessler-scale02-14.pdf.

Disability Social History Project. (2001). *Significant dates in disability history*. Retrieved May 13, 2001, from http://disabilityhistory.org/timelist.html#BC.

Doherty, W. J., McDaniel, S. H., & Hepworth, J. (1994). Medical family therapy: An emerging arena for family therapy. *Journal of Family Therapy, 16*(1), 31-46.

Dosa, N. P., Boeing, N. M., & Kanter, R. K. (2001, March). Excess risk to severe acute illness in children with chronic health conditions. *Pediatrics, 107*(3), 499-504.

Dowling, M., & Dolan, L. (2001). Families with children with disabilities - Inequalities and the social model. *Disability & Society, 16*(1), 21-35.

Downey, G., & Coyne, J. C. (1990). Children of depressed parents: An integrative review. *Psychological Bulletin, 108*(1), 50-76.

Drotar, D. (1997). Relating parent and family functioning to the psychological adjustment of children with chronic health conditions: What have we learned? What do we need to know? *Journal of Pediatric Psychology, 22*(2), 149-165.

Dunst, C. J., Jenkins, V., & Trivette, C. (1984). The family support scale: Reliability and validity. *Journal of Individual, Family, and Community Wellness, 1*(4), 45-52.

Dunst, C. J., Trivette, C. M., & Cross, A. H. (1986). Mediating influences of social support: Personal, family, and child outcomes. *American Journal of Mental Deficiency, 90*(4), 403-417.

Egbuonu, L., & Starfield, B. (1982). Child health and social status. *Pediatrics, 69*(5), 550-557.

Eisenberg, N., Losoya, S., Guthrie, I. K., Murphy, B., Shepard, S. A., Padgett, S. J., Fabes, R. A., Poulin, R., & Reiser, M. (2001). Parental socialization of children's disregulated expression of emotion and externalizing problems. *Journal of Family Psychology, 15*(2), 183-205.

Elder, G. H. (1974). *Children of the great depression.* Chicago: University of Chicago Press.

Elder, G. H. (1998). The life course as development theory. *Child Development, 69*(1), 1-12.

Ellerton, M., Stewart, M. J., Ritchie, J. A., & Hirth, A. M. (1996). Social support in children with a chronic condition. *Canadian Journal of Nursing Research, 28*(4), 15-36.

Evans, G. W. (2004). The environment of childhood poverty. *American Psychologist, 59*(2), 77-92.

Ferris, T. G., Crain, E. F., Oken, E., Wang, L., Clark, S., & Camargo, C. A. (2001). Insurance and quality of care for children with acute asthma. *Ambulatory Pediatrics, 1*(5), 267-274.

Fisher, H. R. (2001). The needs of parents with chronically sick children: A literature review. *Journal of Advanced Nursing, 36*(4), 600-607.

Friedman, T. L. (1995). *From Beirut to Jerusalem.*New York: Anchor Books.

Furukawa, T. A., Kessler, R. C., Slade, T., & Andrews, G. (2003). The performance of the K6 and K10 screening scales for psychological distress in the Australian National Survey of Mental Health and Well-being. *Psychological Medicine, 33,* 357-362.

Garrett, P., Ferron, J., Ng'andu, N., Bryant, D., & & Harbin, G. (1994). A structural model for the developmental status of young children. *Journal of Marriage and the Family, 56,* 147-163.

Garson, G. D. (2003). *Structural equation modeling*. Retrieved June 12, 2003, from http://www2.chass.ncsu.edu/garson/pa765/structur.htm.

Gartstein, M. A., Noll, R. B., & Vannatta, K. (2000). Childhood aggression and chronic illness: Possible protective mechanisms. *Journal of Applied Developmental Psychology, 21*(3), 315-333.

Garwick, A. E., & Millar, H. E. C. (1996). *Promoting resilience in youth with chronic conditions and their families.* Washington D.C. Health Resources and Services Administration (National Maternal and Child Health Clearninghouse).

Gerard, J. M., & Buehler, C. (1999). Multiple risk factors in the family environment and youth problem behaviors. *Journal of Marriage and the Family, 61,* 343-361.

Gerard, J. M., & Krishnakumar, A. (2003, April). *Marital conflict, parenting quality, and youth maladjustment: A longitudinal investigation of the spillover hypothesis.* Poster Session presented at SRCD Annual Conference, Tampa, Florida.

Gerhardt, C. A., Vannatta, K., McKellop, J. M., Zeller, M., Taylor, J., Passo, M., & Noll, R. (2003). Comparing parental distress, family functioning, and the role of social support for caregivers with and without a child with juvenile rheumatoid arthritis. *Journal of Pediatric Psychology, 28*(1), 5-15.

Gil, K. M., Carson, J. W., Porter, L. S., Ready, J., Valrie, C., Redding-Lallinger, R., & Daeschner, C. (2003). Daily stress and mood and their association with pain, health-care use, and school activity in adolescents with sickle cell disease. *Journal of Pediatric Psychology, 28*(5), 363-373.

Gil-Rivas, V., Greenberger, E., Chen, C., & Lopez-Lena, M. M. (2003). Understanding depressed mood in the context of a family-oriented culture. *Adolescence, 38*(149), 93-110.

Gillaspy, S., R., Hoff, A. L., Mullins, L. L., & Van Pelt, J. C., & Chaney. (2002). Psychological distress in high-risk youth with asthma. *Journal of Pediatric Psychology, 27*(4), 363-371.

Guo, G., & Harris, K. M. (2000). The mechanisms mediating the effects of poverty on children's intellectual development. *Demography, 37*(4), 431-447.

Haffner, J., Ester, C., Munch, H., Parzer, P., Raue, B., Steen, R., Klett, M., & Resch, F. (2002). Parent-reported problems of six year old pre-school children: Prevalence and risk factors in an epidemiological study. *Praxis der Kinderpsychologie und Kinderpsychiatrie.* (From*Psyc Info: 0032 -7034*).

Hauser, S. T., Jacobson, A. M., Lavori, P., Wolfsdorf, J. I., Herskowitz, R. D., Milley, J. E., Bliss, R., Wertlieb, D., & Stein, J. (1990). Adherence among children and adolescents with insulin-dependent diabetes mellitus over a four-year longitudinal follow-up: II. Immediate and long-term linkages with the family milieu. *Journal of Pediatric Psychology, 15*(4), 527-542.

Hill-Briggs, F. (2003). Problem solving in diabetes self-management: A model of chronic illness self-management behavior. *Annals of Behavioral Medicine, 25*(3), 182-193.

Hoard, L. R., & Anderson, E. A. (2004). Factors related to depression in rural and urban, non-custodial fathers. *Journal of Community Psychology, 32*(1), 103-119.

Hobfoll, S. E., Johnson, R. J., Ennis, N., & Jackson, A. P. (2003). Resource loss, resource gain, and emotional outcomes among inner city women. *Journal of Personality and Social Psychology, 84*(3), 632-643.

Hofferth, S. L., & Curtin, S. (2004, April). *The association between family income and educational attainment in middle adulthood.* Presented at the Population Association of America, Boston.

Hofferth, S. (1998). *Healthy environments, healthy children: Children in families. A report on the 1997 Panel Study of Income Dynamics Child Development Supplement.* Ann Arbor, Michigan: University of Michigan.

Hofferth, S., Davis-Kean, P. E., Davis, J., & Finkelstein, J. (1997). *The Child Development Supplement of the Panel Study of Income Dynamics: 1997 user guide*. Retrieved August 29, 2002, from http://www.isr.umich.edu/src/child-development/usergd.html.

Holmes, C. S., Yu, Z., & Frentz, J. (1999). Chronic and discrete stress as predictors of children's adjustment. *Journal of Consulting and Clinical Psychology, 67*(3), 411-419.

Holroyd, J., & Guthrie, D. (1986). Family stress with chronic childhood illness: Cystic fibrosis, neuromuscular disease, and renal disease. *Journal of Clinical Psychology, 42*(4), 552-561.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55.

Hyers, D. A. (1995). A structural analysis of relationships among stress, social support, dysfunctional attitudes, and depression in older adults [Abstract]. *Dissertation Abstracts International, 56*(6-A), 2117.

Institute for Social Research. (1999, October 27). *Description of the 1997 PSID Child Supplement weights*. Retrieved August 1, 2003, from http://psidonline.isr.umich.edu/CDS/weightsdoc.html.

Institute for Social Research. (2002). *The PSID: Family income data 1997: Code book*. Retrieved June 5, 2002, from University of Michigan: http://www.isr.umich.edu/src/psid/income/faminc/famcbk97.htm.

Isaacs, D., & Sewell, J. R. (2003). Children with chronic conditions. *The Medical Journal of Australia, 179*(5), 235-236.

Jacelon, C. S. (1997). The trait and process of resilience. *Journal of Advanced Nursing, 25,* 123-129.

Jackson, A. P., Brooks-Gunn, J., Huang, C.-C., & Glassman, M. (2000). Single mothers in low-wage jobs: Financial strain, parenting, and preschoolers' outcomes. *Child Development, 71*(5), 1409-1423.

Jackson, A. P., Gyamfi, P., Brooks-Gunn, J., & Blake, M. (1998). Employment status, psychological well-being, social support, and physical discipline practices of single black mothers. *Journal of Marriage and the Family, 60,* 894-902.

Jackson, P. B. (1992). Specifying the buffering hypothesis: Support, strain, and depression. *Social Psychology Quarterly, 55*(4), 365-378.

Jekielek, S. M. (1998). Parental conflict, marital disruption, and children's emotional well-being. *Social Forces, 76*(3), 905-936.

Jessop, D. J., & Stein, R. E. K. (1985). Uncertainty and its relation to the psychological and social correlates of chronic illness in children. *Social Science Medicine, 20*(10), 993-999.

Juang, L. P., & Silbereisen, R. (2002). The relationship between adolescent academic capability beliefs, parenting and school grades. *Journal of Adolescence, 25*(1), 3-18.

Kaplan, R. M., & Hartwell, S. L. (1987). Differential effects of social support and social network on physiological and social outcomes in men and women with type two diabetes mellitus. *Health Psychology, 6*(5), 387-398.

Katz, S., & Krulik, T. (1999). Fathers of children with chronic illness: Do they differ from fathers of healthy children? *Journal of Family Nursing, 5*(3), 292-315.

Kazak, A. E., & Christakis, D. A. (1994). Caregiving issues in families of children with chronic medical conditions. In E. Kahana, D. E. Biegel & M. L. Wykle (Eds.), *Family caregiver applications series: Volume 4; Family caregiving across the lifespan* (pp. 331-355). Thousand Oaks, California: Sage.

Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S.-L. T., Walters, E. E., & Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine, 32*, 959-976.

Kessler, R. C., Barker, P. R., Colpe, L. J., Epstein, J. F., Gfroerer, J. C., Hiripi, E., Howes, M. J., Normand, S. T., Manderscheid, R. W., Walters, E. E., & Zaslavsky, A. M. (2003a). Screening for serious mental illness in the general population. *Archive of General Psychiatry, 60,* 184-189.

Kessler, R., Demler, O.; Jin, R.; Koretz, D.; Merikangas, K.R.; Rush, A.J.; Walters, E.E.; & Wang, P.S. (2003b). The epidemiology of major depressive disorder: Results from the National Comorbidity Survey Replication. *Journal of the American Medical Association, 289*(23), 3095-3105.

Kessler, R., DuPont, R., Berglund, P., & Wittchen, H. (2000). Impairment in pure and comorbid generalized anxiety disorder and major depression at 12 months in two national surveys. *American Journal of Psychiatry, 157*(12), 2060-2061.

King, G., King, S., Rosenbaum, P., & Goffin, R. (1999). Family-centered caregiving and well-being of parents of children with disabilities: Linking process with outcome. *Journal of Pediatric Psychology, 24*(1), 41-53.

Kirschstein, R. (2000, February). *Disease-specific estimates of direct and indirect costs of illness and NIH support*. Retrieved October 31, 2003, from http://www1.od.nih.gov/osp/ospp/ecostudies/COIreportweb.htm.

Klausli, J. F., & Owen, M. T. (2003, April). *Relations between marriage and parenting for fathers and mothers.* In *Poster session.* Society for Research in Child Development, Tampa, Florida.

Klebanov, P. K., Brooks-Gunn, J., & Duncan, G. J. (1994). Does neighborhood and family poverty affect mothers' parenting, mental health, and social support? *Journal of Marriage and the Family, 56*, 441-455.

Klerman, L. V. (1988). School absence: A health perspective. *The Pediatric Clinics of North America, 35*(6), 1253-1269.

Kline, R. B. (1998). *Principles and practice of structural equation modeling.* New York: The Guildford Press.

Klinnert, M. D., McQuaid, E. L., McCormick, D., Adinoff, A. D., & Bryant, N. E. (2000). A multimethod assessment of behavioral and emotional adjustment in children with asthma. *Journal of Pediatric Psychology, 25*(1), 35-46.

Knafl, K., & Zoeller, L. (2000). Childhood chronic illness: A comparison of mothers' and fathers' experiences. *Journal of Family Nursing, 6*(3), 287-302.

Krall, L. P. (1978). *Joslin Diabetes Manual (11th ed.).* Philadelphia, PA: Lea & Sebiger.

Kwon, H.-K., & Rueter, M. A. (2003, November 22). *Protecting adolescents from the long-term effects of economic pressure: The moderating role of parenting.* Presented at the National Council on Family Relations, Vancouver, BC.

La Greca, A. M. (1992). Peer influences in pediatric chronic illness: An update. *Journal of Pediatric Psychology, 17*(6), 775-784.

La Greca, A. M., Auslander, W. F., Grecco, P., Spetter, D., Fisher, E. B., & Santiago, J. V. (1995). I get by with a little help from my family and friends: Adolescent's support for diabetes care. *Journal of Pediatric Psychology, 20*(4), 449-476.

La Greca, A., & Bearman, K. J. (2002). The diabetes social support questionnaire-family version: Evaluating adolescents' diabetes-specific support from family members. *Journal of Pediatric Psychology, 27*(8), 665-676.

Lavee, Y. (1988). Linear structural relations (LISREL) in family research. *Journal of Marriage and the Family, 50,* 937-948.

LeBlanc, L. A., Goldsmith, T., & Patel, D. (2003). Behavioral aspects of chronic illness in children and adolescents. *Pediatric Clinics of North America, 50*(4), 859-878.

Lee, C., & Gotlib, I. (1989). Maternal depression and child adjustment: A longitudinal analysis. *Journal of Abnormal Psychology, 98,* 78-85.

Linver, M. R., Brooks-Gunn, J., & Kohen, D. E. (2002). Family processes as pathways from income to young children's development. *Developmental Psychology, 38*(5), 719-734.

Littlefield, C. H., Rodin, G. M., Murray, M. A., & Craven, J. L. (1990). Influence of functional impairment and social support on depressive symptoms in persons with diabetes. *Health Psychology, 9*(6), 737-749.

Loehlin, J. C. (1998). *Latent variable models: An introduction to factor, path, and structural analysis (3rd ed.).* Mahwah, New Jersey: Lawrence Erlbaum Associates.

Lopez, M. L. (1998, March). The relationship between recurrent otitis media and parent-child interactions. *Dissertation Abstracts International: Section B: The Sciences & Engineering, 58(9-B),* 5164. In.

Lorenz, F. O., Conger, R. D., & Montague, R. (1994). Doing worse and feeling worse: Psychological consequences of economic hardship. In R. D. Conger & G. H. Elder Jr. (Eds.), *Families in troubled times: Adapting to change in rural America* (pp. 167-185). New York: Aldine de Gruyter.

Mailick, M. D., & Holden, G. (1994). Coping with childhood asthma: Caretakers' views. *Health & Social Work, 19*(2), 103-112.

Mandleco, B. L., & Peery, J. C. (2000). An organizational framework for conceptualizing resilience in children. *Journal of Child & Adolescent Psychiatric Nursing, 13*(3), 99-112.

Manuel, J. C. (2001). Risk and resistance factors in the adaptation in mothers of children with juvenile rheumatoid arthritis. *Journal of Pediatric Psychology, 26*(4), 237-246.

Marks, N. (1998). Does it hurt to care? Caregiving, work family conflict, and midlife well-being. *Journal of Marriage and the Family, 60,* 951-966.

McCubbin, M. A. (1988). Family stress, resources, and family types: Chronic illness in children. *Family Relations, 37,* 203-210.

McCubbin, M., Balling, K., Possin, P., Frierdich, S., & Bryne, B. (2002). Family resiliency in childhood cancer. *Family Relations, 51*(2), 103-112.

McCubbin, M., & McCubbin, H. (1996). Resiliency in families: A conceptual model of family adjustment and adaptation in response to stress and crisis. In H. McCubbin, A. Thompson & M. McCubbin (Eds.), *Family assessment: Resiliency, coping and adaptation - inventories for research and practice* (pp. 1-64). Madison, Wisconsin: University of Wisconsin System.

McLoyd, V. C. (1990). The impact of economic hardship on black families and children: Psychological distress, parenting, and socioemotional development. *Child Development, 61,* 311-346.

McLoyd, V., & Wilson, L. (1990). Maternal behavior, social support, and economic conditions as predictors of distress in children. In V. C. McLoyd & C. Flanagan (Eds.), *New directions for child development: No. 46. Economic stress: Effects on family life and child development* (pp. 49-69). San Francisco: Jossey-Bass.

McPherson, M., Arango, P., Fox, H., McManus, M., Newacheck, P. W., Perrin, J. M., Shonkoff, J. P., & Strickland, B. (1998). A new definition of children with special health care needs. *Pediatrics, 102*(1), 137-140.

Menaghan, E. G., & Parcel, T. L. (1991). Determining children's home environments: The impact of maternal characteristics and current occupational and family conditions. *Journal of Marriage and the Family, 53*(2), 417-431.

Menaghan, E. G., & Parcel, T. L. (1995). Social sources of change in children's home environments: The effects of parental occupational experiences and family conditions. *Journal of Marriage and the Family, 57*(1), 69-84.

Miller, J. E. (2000). The effects of race/ethnicity and income on early childhood asthma prevalence and health care use. *American Journal of Public Health, 90*(3), 428-430.

Miller, J. E., & Davis, D. (1997). Poverty history, marital history, and quality of children's home environments. *Journal of Marriage and the Family, 59,* 996-1007.

Miller, R., Sabin, C. A., Goldman, E., Clemente, C., Sadowski, H., Taylor, B., & Lee, C. A. (2000). Coping styles in families with hemophilia. *Psychology, Health, and Medicine, 5*(1), 3-12.

Minden, D. J. (1999). Vulnerability and resilience in children with chronic illness: An exploration of the role of the family. *Dissertation Abstracts International: The Sciences and Engineering, 60*(1-B3), 371.

Moore, K. A., Chalk, R., Scarpa, J., & Vandivere, S. (2002). *Preliminary research on family strengths* (A KIDS COUNT working paper). Child Trends.

Morgan, D. (2001, February 14). *U.S. eugenics like Nazi policy study: Forced sterilizations carried out longer than thought*. Retrieved February 20, 2001, from ABC News.com: abcnews.go.com/sections/science/DailyNews/eugenics_000214.html.

Moris, P., Meesters, C., & van den Berg, S. (2003). Internalizing and externalizing problems as correlates of self-reported attachment style and perceived parental rearing in normal adolescents. *Journal of Child & Family Studies, 12*(2), 171-183.

Mosley, J., & Thomson, E. (1995). Fathering behavior and child outcomes: The role of race and poverty. In W. Marsiglio (Ed.), *Fatherhood: Contemporary theory, research, and social policy* (pp. 148-165). Thousand Oaks, CA: Sage.

Msall, M. E., Avery, R. C., Tremont, M. R., Lima, J. C., Rogers, M. L., & Hogan, D. P. (2003). Functional disability and school activity limitations in 41,300 school age children: Relationship to medical impairments. *Pediatrics, 111*(3), 548-553.

Mullins, L. L., Chaney, J. M., Hartman, V. L., Olson, R. A., Youll, L. K., Reyes, S., & Blackett, P. (1995). Child and maternal adaptation to cystic fibrosis and insulin-dependent diabetes mellitus: Differential patterns across disease states. *Journal of Pediatric Psychology, 20*(2), 173-186.

Nassau, J. H., & Drotar, D. (1995). Social competence in children with IDDM and asthma: Child, teacher, and parent reports of children's social adjustment, social performance, and social skills. *Journal of Pediatric Psychology, 20*(2), 187-204.

National Chronic Care Consortium. (2003). *The prevalence and cost of chronic conditions*. Retrieved October 30, 2003, from Partnership for solutions: Better lives for people with chronic conditions: http://www.nccconline.org/pdf/PrevalenceandCostFacts.pdf.

National Council on Family Relations. (2003). *Promoting effective mothering in low income and working-poor families.* Minneapolis, Minnesota: Author.

National Institute on Disability and Rehabilitation Research. (1999). *Long-range plan 1999-2003.* Washington, DC: Author.

National Institutes of Diabetes & Digestive & Kidney Disorders. (2003, May). National diabetes statistics. In *NIH Publication No. 03-3892*. Retrieved from http://diabetes.niddk.nih.gov/dm/pubs/statistics/index.htm#8.

National Institutes of Health. (1996, September). *National asthma education and prevention program task force on the cost effectiveness, quality of care, and financing of asthma care* (NO. 55-807). Retrieved October 30, 2003, from National Institutes of Health: National Heart, Lung, and Blood Institute: http://www.nhlbi.nih.gov/health/prof/lung/asthma/ast_cost.pdf.

Neff, J. M., Sharp, V. L., Muldoon, J., Graham, J., Popalisky, J., & Gay, J. C. (2002). Identifying and classifying children with chronic conditions using administrative data with the clinical risk group classification system. *Ambulatory Pediatrics, 2*(1), 71-79.

Newacheck, P. W., & Halfon, N. (1998). Prevalence and impact of disabling chronic conditions in childhood. *American Journal of Public Health, 88*(4), 610-617.

Newacheck, P. W., Hughes, D. C., Hung, Y.-Y., Wong, S., & Stoddard, J. J. (2000). The unmet health needs of America's children. *Pediatrics, 105*(4), 989-997.

Newacheck, P. W., & Taylor, W. R. (1992). Childhood chronic illness: Prevalence, severity, and impact. *American Journal of Public Health, 82*(3), 364-371.

Newacheck, P. W., Strickland, B., Shonkoff, J. P., Perrin, J. M., McPherson, M., McManus, M., Lauver, C., Fox, H., & Arango, P. (1998, July). An epidemiological profile of children with special health care needs. *Pediatrics, 102*(1), 117-123.

Newcomb, M. D., & Bentler, P. M. (1988). Impact of adolescent drug use and social support on problems of young adults: A longitudinal study. *Journal of Abnormal Psychology, 97*(1), 64-75.

Noll, R. B., Gartstein, M. A., Vannatta, K., Correll, J., Bukowski, W. M., & Davies, W. H. Social, emotional, and behavioral functioning of children with cancer. *Pediatrics, 103*(1), 71-78.

Norbeck, J., Lindsey, A., & Carrieri, V. (1981). The development of an instrument to measure social support. *Nursing Research, 30,* 264-269.

Northam, E., Anderson, P., Adler, R., & Werther, G. (1996). Psychosocial and family functioning in children with insulin-dependent diabetes at diagnosis and one year later. *Journal of Pediatric Psychology, 21*(5), 699-717.

Olkin, R. (1999). *What psychotherapists should know about disability.* New York: The Guilford Press.

Oltmanns, T. F., & Emery, R. E. (1998). *Abnormal psychology (2nd ed.).* New Jersey: Prentice Hall.

Paradise, J. L., Feldman, H. M., Colborn, D. K., Campbell, T. F., Dollaghan, C. A., Rockette, H. E., Janosky, J. E., Kurs-Lasky, M., Bernard, B. S., & Smith, C. G. (1999). Parental stress and parent-rated child behavior in relation to otitis media in the first three years of life. *Pediatrics, 104*(6), 1264-1273.

Parcel, T. L., & Menaghan, E. G. (1989). *Child home environment as a mediating construct between SES and child outcomes.*, The Ohio State University, Columbus, Ohio.

Parcel, T. L., & Menaghan, E. G. (1990). Maternal working conditions and children's verbal facility: Studying the intergenerational transmission of inequality from mothers to young children. *Social Psychology Quarterly, 53,* 132-147.

Parcel, T. L., & Menaghan, E. G. (1993). Family social capital and children's behavior problems. *Social Psychology Quarterly, 56*(2), 120-135.

Patterson, J. (1991). Family resilience to the challenge of a child's disability. *Pediatric Annals, 20*(8), 491-499.

Perrin, J. M., MacLean, W. E., & Perrin, E. C. (1989). Parental perceptions of health status and psychological adjustment of children with asthma. *Pediatrics, 83*(1), 26-30.

Peterson, J. L., & Zill, N. (1986). Marital disruption, parent-child relationships, and behavior problems in children. *Journal of Marriage and the Family, 48*(2), 295-307.

Pettit, G. S., Bates, J. E., & Dodge, K. A. (1997). Supportive parenting, ecological context, and children's adjustment: A seven year longitudinal study. *Child Development, 68*(5), 908-924.

Peyrot, M. (1996). Causal analysis: Theory and application. *Journal of Pediatric Psychology, 21*(1), 3-24.

Pinderhughes, E. E., Nix, R., Foster, E. M., & Jones, D. (2001). Parenting in context: Impact of neighborhood poverty, residential stability, public services, social networks, and danger on parental behaviors. *Journal of Marriage and Family, 63,* 941-953.

Pledger, C. (2003). Discourse on disability and rehabilitation issues. *American Psychologist, 58*(4), 279-284.

Reinherz, H. Z., Giaconia, R. M., Wasserman, M. S., Silverman, A. B., & Burton, L. (1999). Coming of age in the 1990's: Influences of contemporary stressors on major depression in young adults. In P. Cohen & C. Slomkowski (Eds.), *Historical and geographical influences on psychopathology* (pp. 141-161). Mahwah, NJ: Lawrence Erlbaum Associates.

Richters, J., & Pellegrini, D. (1989). Depressed mothers' judgments about their children: An examination of the depression-distortion hypothesis. *Child Development, 60,* 1068-1075.

Rodder, I., Kroonenberg, P.M., & Boekaerts, M. (2003). Psychosocial functioning and stress-processing of children with asthma in the school context: Differences and similarities with children without asthma. *Journal of Asthma, 40*(7), 777-787.

Rogers, C. H., & Floyd, F. J. (2003, April). *The effects of maternal stress on child internalizing problems for children with chronic illness.* In *Poster session.* Society for Research in Child Development, Tampa, Florida.

Rogers, S. J., Parcel, T. L., & Menaghan, E. G. (1991). The effects of maternal working conditions and mastery on child behavior problems: Studying the intergenerational transmission of social control. *Journal of Health and Social Behavior, 32*(2), 145-164.

Russell, M. (1998). *Beyond ramps: Disability at the end of the social contract.* Maine: Common Courage Press.

Saltaris, C., Serbin, L. A., Stack, D. M., Karp, J. A., Schwartzman, A. E., & Ledingham, J. E. (2004). Nurturing cognitive competence in preschoolers: A longitudinal study of intergenerational continuity and risk. *International Journal of Behavioral Development, 28*(2), 105-115.

Schilmoeller, G. L., & Baranowski, M. D. (2003, November 21). *Grandparent involvement and support in families with children with disabilities.* Poster session presented at the National Council on Family Relations, Vancouver BC.

Schor, E. L., Billingsley, M. M., Golden, A. L., McMillan, J. A., & Meloy, L. D. (2003). Family pediatrics: Report of the task force on the family. *Pediatrics, 111*(6), 1541-1569.

Schwarz, C., & Lui, E. (2000). *The link between school performance and health insurance: Current research*. San Francisco, California: Consumers Union.

Shaw, B. A., Krause, N., Chatters, L. M., Connell, C. M., &. Ingersoll-Dayton, B. (2004). Emotional support from parents early in life, aging, and health. *Psychology and Aging, 19*(1), 4-12.

Silver, E. J., Bauman, L. J., & Ireys, H. T. (1995). Relationships of self-esteem and efficacy to psychological distress in mothers of children with chronic physical illness. *Health Psychology, 14*(4), 333-340.

Simons, R. L., Lorenz, F. O., Conger, R. D., & Wu, C.-I. (1992). Support from spouse as mediator and moderator of the disruptive influence of economic strain on parenting. *Child Development, 63,* 1282-1301.

Simons, R. L., Lorenz, F. O., Wu, C.-I., & Conger, R. D. (1993). Soical network and marital support as mediators and moderators of the impact of stress and depression on parental behavior. *Developmental Psychology, 29*(2), 368-381.

Smith, L. A., Romero, D., Wood, P. R., Wampler, N. S., Chavkin, W., & Wise, P. H. (2002). Employment barriers among welfare recipients and applicants with chronically ill children. *American Journal of Public Health, 92*(9), 1453-1457.

Spence, L. J. (1993). Family adaptation to chronic childhood illness (Doctoral dissertation, Michigan State University). *Dissertation Abstracts International, 53*, 4969-B.

Stark, P. (2000, July 11). *Introduction of the Chronic Illness Care Improvement Act of 2000* (Statement to House of Representatives). Retrieved November 20, 2001, from http://www.house.gov/stark/documents/106th/hr4981intro.html.

Stets, J. E. (1991). Cohabitating and marital aggression: The role of social isolation. *Journal of Marriage and the Family, 53*(3), 669-680.

Swallow, V. M., & Jacoby, A. (2001). Mothers' coping in chronic childhood illness: The effect of presymptomatic diagnosis of versicoureteric reflux. *Journal of Advanced Nursing, 33*(1), 69-79.

Sweet, J., Bumpass, L., & Call, V. (1988). *The design and content of the National Survey of Families and Households.* Madison, WI: Center for Demography and Ecology, University of Wisconsin.

Tak, Y. R., & McCubbin, M. M. (2002). Family stress, perceived social support and coping following the diagnosis of a child's congenital heart disease. *Journal of Advanced Nursing, 39*(2), 190-198.

Takeuchi, D. T., Williams, D. R., & Adair, R. K. (1991). Economic stress in the family and children's emotional and behavioral problems. *Journal of Marriage and the Family, 53,* 1031-1041.

Tannila, A., Jarvelin, M., & Kokkonen, J. (1999). Cohesion and parents' social relations in families with a child with disability or chronic illness. *International Journal of Rehabilitation Research, 22*(2), 101-109.

Tate, D. G., & Pledger, C. (2003). An integrative conceptual framework of disability. *American Psychologist, 58*(4), 289-295.

Taylor, R. J., Chatters, L. M., Tucker, M. B., & Lewis, E. (1990). Developments in research on black families: A decade review. *Journal of Marriage and the Family, 52,* 993-1014.

Thernlund, G., Dahlquist, G., Ivarsson, S. A., & Ludvigsson, J. (1996). The initial psychological reactions of the parents at the onset of insulin-dependent diabetes mellitus in children and short-time adaptation. *Nordic Journal of Psychiatry, 50*(3), 199-206.

Thompson, R. J., Armstrong, F. D., Link, C. L., Pegelow, C., H., Moser, F., & Wang, W. C. (2003). A prospective study of the relationship over time of behavior problems, intellectual functioning, and family functioning in children with sickle cell disease: A report from the cooperative study of sickle cell disease. *Journal of Pediatric Psychology, 28*(1), 59-65.

Thompson, R. T., Armstrong, F. D., Kronenberger, W. G., Scott, D., McCabe, M. A., Smith, B., Radcliffe, J., Colangelo, L., Gallagher, D., Islam, S., & Wright, E. (1999). Family functioning, neurocognitive functioning, and behavior problems in children with sickle cell disease. *Journal of Pediatric Psychology, 24*(6), 491-498.

Thomson, E., Hanson, T. L., & McLanahan, S. S. (1994). Family structure and child well-being: Economic resources vs. parental behaviors. *Social Forces, 73*(1), 221-242.

Timko, C., Stovel, K. W., & Moos, R. H. (1992). Functioning among mothers and fathers of children with juvenile rheumatic disease: A longitudinal study. *Journal of Pediatric Psychology, 17,* 705-724.

Turner, R. J. (1981). Social support as a contingency in psychological well-being. *Journal of Health and Social Behavior, 22,* 357-367.

Underwood, T. H. (1997). IDDM youths' perceptions of well-youths' attitudes [Abstract]. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 57*(11-B), 7239.

U.S. Census Bureau. (2000). *Profile of selected economic characteristics: 2000*. Retrieved May 24, 2004, from http://censtats.census.gov/data/US/01000.pdf

Vandewater, E. A., & Lansford, J. E. (1998). Influences of family structure and parental conflict on children's well-being. *Family Relations, 47,* 323-330.

Vandivere, S., Moore, K. A., & Brown, B. (2000). Child well-being at the outset of welfare reform: An overview of the Nation and 13 states. *New federalism: National survey of America's families*, B-23. Retrieved September 19, 2003, from the Urban Institute: http://www.urban.org/Template.cfm?NavMenuID=24&template=/TaggedContent/ViewPublication.cfm&PublicationID=7037

Vinokur, A. D., Price, R. H., & Caplan, R. D. (1996). Hard times and hurtful partners: How financial strain affects depression and relationship satisfaction of unemployed persons and their spouses. *Journal of Personality and Social Psychology, 71*(1), 166-179.

Vinson, J. A. (2002). Children with asthma: Initial development of the child resilience model. *Pediatric Nursing*, *28*(2), 149-159.

Voydanoff, P., & Donnelly, B. W. (1998). Parents' risk and protective factors as predictors of parental well-being and behavior. *Journal of Marriage and the Family, 60,* 344-355.

Wallander, J. L., & Varni, J. W. (1989). Social support and adjustment in chronically ill and handicapped children. *American Journal of Community Psychology, 17*(2), 185-201.

Wallander, J. L., Varni, J. W., Babani, L., Banis, H. T., & Wilcox, K. T. (1989). Family resources as resistance factors for psychological maladjustment in chronically ill and handicapped children. *Journal of Pediatric Psychology, 14*(2), 157-173.

Wanamaker, C. E., & Glenwick, D. S. (1998). Stress, coping, and perceptions of child behavior in parents of preschoolers with cerebral palsy. *Rehabilitation Psychology, 43*(4), 297-312.

Weitzman, M., Klerman, L. V., Lamb, G., Menary, J., & Alpert, J. J. (1982). School absence: A problem for the pediatrician. *Pediatrics, 69*(6), 739-746.

Wertlieb, D. (2003). Converging trends in family research and pediatrics: Recent findings for the American Academy of Pediatrics Task Force on the Family. *Pediatrics, 111*(6), 1572-1587.

Westbrook, L. E., Silver, E. J., & Stein, R. E. K. (1998). Implications for estimates of disability in children: A comparison of definitional components. *Pediatrics, 101*(6), 1025-1031.

Wise, P. H., Wampler, N. S., Chavkin, W., & Romero, D. (2002, September). Chronic illness among poor children enrolled in the temporary assistance for needy families program. *American Journal of Public Health, 92*(9), 1458-1461.

Yeung, W. J., Linver, M. R., & Brooks-Gunn, J. (2002). How money matters for young children's development: Parental investment and family processes. *Child Development, 73*(6), 1861-1879.

Zarit, S. H. (1989). Do we need another 'stress and caregiving' study? *Gerontologist, 29*(2), 11-12.

Zhou, Q., Eisenberg, N., Losoya, S. H., Fabes, R. A., Reiser, M., Guthrie, I. K., Murphy, B. C., Cumberland, A. J., & Shepard, S. A. (2002). The relations of parental warmth and positive expressiveness to children's empathy-related responding and social functioning: A longitudinal study. *Child Development, 73*(3), 893-916.

Zimmerman, M. C., Ramirez-Valles, J., Zapert, K. M., & Maton, K. I. (2000). A longitudinal study of stress-buffering effects of urban African-American male adolescent problem behaviors and mental health. *Journal of Community Psychology, 28*(1), 17-33.